West Fork Timber Timber Sale

Environmental Assessment

May 15, 2013
Montana Department of Natural Resources and Conservation
Southwestern Land Office
Missoula Unit

CHECKLIST ENVIRONMENTAL ASSESSMENT

Project Name:	**West Fork Timber Creek Timber Sale**
Proposed Implementation Date:	**July 2013 – June 2016**
Proponent:	**Missoula Unit**
Location:	**Sections 15 & 16, T19N – R30W**
County:	**Mineral**

I. TYPE AND PURPOSE OF ACTION

The Montana Department of Natural Resources and Conservation (DNRC), proposes to conduct forest management activities in Sections 15 and 16, T19N R30W. The proposed action would involve: harvesting approximately 9,000 tons (1.4 MMBF) of sawtimber from approximately 125 acres utilizing commercial thinning and salvage treatments. Prescribed burning of slash piles by DNRC employees would be performed after the completion of harvest activities.

The lands in this project area are held in trust by the State of Montana for the support of specific beneficiary institutions (Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X, Section 11). The Board of Land Commissioners (Land Board) and DNRC are legally required to administer these trust lands to produce the largest measure of reasonable and legitimate long-term return for the trust beneficiaries (Montana Code Annotated 77-1-202).

Revenue generated from this project would be applied to the Public Buildings (PB – Section 15) and Common Schools (CS – Section 16) grants. Approximately $100,000 to $180,000 ($10/ton to $18/ton) would be generated from the proposed action. The proposed action would be implemented as early as July 2013 and could be completed by June 2016. Slash work and burning associated with the sale may not be completed until 2017. These dates are approximate.

This project was developed in compliance with the State Forest Land Management Plan (SFLMP), the Administrative Rules for Forest Management (Forest Management Rules; ARM 36.11.401 through 471) and all other applicable state and federal laws. One of the units in Section 16 of the project area is covered under the Montana DNRC Forested State Trust Lands Habitat Conservation Plan (HCP).

II. PROJECT DEVELOPMENT

1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED:
Provide a brief chronology of the scoping and ongoing involvement for this project. List number of individuals contacted, number of responses received, and newspapers in which notices were placed and for how long. Briefly summarize issues received from the public.

The West Fork Timber Creek Timber Sale was proposed following a land exchange between the Montana DNRC and the U.S. Forest Service. The DNRC conducted a timber sale in Section 16, T19N, R30W in 1996 and again in 2007 – 2009. After the completion of these timber sales, the Lolo Land Exchange was completed resulting in the DNRC acquisition of 120 acres in Section 15, 80 acres in Section 16 and 40 acres in Section 17 of T19N – R30W.

Comments from the general public, interest groups, and agency specialists were solicited in 2011. Scoping notices were sent to 49 agencies and individuals. Newspaper articles were published in The Mineral County Independent and The Missoulian in July, 2011. Written and/or verbal comments were received from the following individuals and/or organizations: Rex Lincoln, Jeffery Lawrence, the Mineral County Commissioners, Gordon Johnson and Scott Kuehn of Tricon Timber LLC and the Montana Fish Department of Wildlife and Parks as well as internal comments from the DNRC archeologist and fisheries biologist. Internal and external issues and concerns were incorporated into the project design and will be implemented in the associated contracts.

2. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED:
Examples: cost-share agreement with U.S. Forest Service, 124 Permit, 3A Authorization, Air Quality Major Open Burning Permit.

Montana Department of Environmental Quality (DEQ)
The DNRC is classified as a major open burner by the Montana Department of Environmental Quality (DEQ) and is issued a permit from the DEQ to conduct burning activities on the State owned lands it manages. As a major open burning permit holder, DNRC agrees to comply with all of the limitations and conditions of the permit.

Montana/Idaho Airshed Group
The DNRC is a member of the Montana/Idaho Airshed Group which regulates prescribed burning related to forest management activities. As a member of the Airshed Group, DNRC agrees to burn only on days approved for good smoke dispersion as determined by the Smoke Management Unit in Missoula, MT.

3. ALTERNATIVE DEVELOPMENT:
Describe alternatives considered and, if applicable, provide brief description of how the alternatives were developed. List alternatives that were considered but eliminated from further analysis and why.

Alternative A – No Action: Under this alternative, no large scale timber harvest would occur on the project area at this time. No revenue would be generated for the Common School or Public Building

Trusts for the specific lands included within the project area. DNRC approved activities would continue in the project area based on unit priorities and available funding. Lodgepole pine mortality would likely continue, resulting in lost revenue to the trust, non-compliance with the trust mandate and continued accumulation of hazardous fuels.

Alternative B – Action: Under this alternative, the DNRC would continue current uses and harvest approximately 1.4 MMBF of timber from approximately 125 acres utilizing commercial thinning and salvage treatments. The majority of healthy western larch, ponderosa pine and Douglas fir would be retained while thinning the suppressed and less healthy Douglas fir. Lodgepole pine would be removed as it is stagnating and/or infested with Mountain Pine Beetles and is dying or dead.

There will be 1.54 miles of temporary roads constructed to access the proposed harvest units. These roads would be ripped and slashed following harvest activities to discourage motorized travel off the main county roads.

Silvicultural prescriptions were developed to emulate natural disturbance processes as required by the Montana Administrative Rules for Forest Management (ARM 36.11.408). Commercial thinning and salvage treatments would retain large vigorous mature ponderosa pine, western larch and Douglas fir trees. Reducing competition in these stands would likely reduce the risk of insect and disease infestations currently occurring in the region. Maintenance of multi-aged, mixed species stands through commercial thinning would maintain structural diversity, promote regeneration of seral species in canopy gaps and improve resistance to insect infestation. Large openings may provide opportunities for planting and retaining species diversity.

III. IMPACTS ON THE PHYSICAL ENVIRONMENT

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" If no impacts are identified or the resource is not present.*

4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:

Consider the presence of fragile, compactable or unstable soils. Identify unusual geologic features. Specify any special reclamation considerations. Identify direct, indirect, and cumulative effects to soils.

With the implementation of Best Management Practices and mitigation measures, the proposed action represents low to moderate risk of detrimental direct, indirect and cumulative impacts to soils.

See Attachment B for a detailed soils analysis.

5. WATER QUALITY, QUANTITY AND DISTRIBUTION:

Identify important surface or groundwater resources. Consider the potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality. Identify direct, indirect, and cumulative effects to water resources.

With the implementation of Best Management Practices and mitigation measures, the proposed action represents low risk of detrimental direct, indirect and cumulative impacts to water quality, quantity and distribution,.

See Attachment B for a detailed watershed analysis.

6. AIR QUALITY:

What pollutants or particulate would be produced (i.e. particulate matter from road use or harvesting, slash pile burning, prescribed burning, etc)? Identify the Airshed and Impact Zone (if any) according to the Montana/Idaho Airshed Group. Identify direct, indirect, and cumulative effects to air quality.

The DNRC is a member of the Montana/Idaho Airshed group which regulates prescribed burning including both slash and broadcast burning associated with DNRC forest management activities. As a member of the Airshed Group, DNRC agrees to burn only on days approved for good smoke dispersion as determined by the Smoke Management Unit in Missoula, Montana.

The project area is in Airshed 2 which encompasses much of Mineral County. There are no impact zones near the area.

Alternative A: No Action

Under this alternative, no changes to air quality would occur and no pollutants or particulate would be produced. No prescribed burning of logging slash or logging truck traffic would occur as a result of the proposed project.

Alternative B: Action

The proposed action would require burning logging slash at log landings. Adequate amounts of slash would be retained in harvest units to facilitate nutrient cycling and would not be burned. Smoke produced from slash burning could result in a minor temporary impact to localized air quality. Over 70% of emissions emitted from prescribed burning are less than 2.5 microns (National Ambient Air Quality PM 2.5). High, short term levels of PM 2.5 or smaller airborne particulates may be hazardous. Within the typical column of biomass burning, the chemical toxins are: Formaldehyde, Acrolein, Acetaldehyde, 1,4 Butadiene and Polycyclic Organic Matter.

Harvesting equipment and log hauling may create dust that could impact air quality. Mitigations such as dust abatement or winter logging would be required to reduce or eliminate the impacts from these activities, therefore, there is low risk of direct, indirect or cumulative effects to air quality.

7. VEGETATION COVER, QUANTITY AND QUALITY:

What changes would the action cause to vegetative communities? Consider rare plants or cover types that would be affected. Identify direct, indirect, and cumulative effects to vegetation.

Alternative A: No Action

Under this alternative, no changes to vegetation cover, quantity and quality would occur as a result of the proposed action. The lodgepole pine would continue to succumb to the Mountain Pine Beetle and competition from other tree species. The shade tolerant species such as Douglas fir, grand fir and sub-alpine fir would likely become the dominant species in these ponderosa pine and western white pine stands. Integrated weed management, including monitoring and treatment, would continue as funding allows under the No Action alternative.

Alternative B: Action

The DNRC is committed to maintaining biodiversity by managing for appropriate stand structures and compositions on state lands (ARM 36.11.404). Appropriate stand cover types are determined by the ecological characteristics of the site (habitat type, current stand conditions, climate, disturbance regime, etc.) and estimated historical conditions that existed on the site prior to European settlement. The project area currently exhibits approximately 60% of the stands within its boundaries as having fewer acres of the western white pine and ponderosa pine cover types than desired while approximately 40% have an excess of western larch/Douglas fir, mixed conifer and Lodgepole pine cover types as identified by the DNRC Stand Level Inventory (DNRC SLI 2004). If this alternative would be selected, cover types would shift more toward the desired future condition. This would be reflected in a higher proportion of western white pine and ponderosa pine stands with a lesser component of western larch/Douglas fir and Lodgepole pine stands.

Current cover types and desired future conditions for the West Fork Timber Creek Project Area.

Cover Type	Current Cover Type (net acres*)	Desired Future Condition (net acres*)	Current Cover Type - (minus) Desired Future Condition (net acres*)
Western White Pine	0	99	-99
Ponderosa Pine	57	98	-41
Lodgepole Pine	33	24	9
Western Larch/Douglas-fir	64	19	45
Mixed Conifer	86	0	86
Grand Total	240	240	

* Net acres refers to the acres in a stand polygon excluding road clearing widths.

The habitat types of stands within the project area belong to Fire Group 11 with grand fir as the indicated climax species. Fire severity varies in this fuel type due to the moist nature of these forests and variable fuel loading. Historic fire intervals typically ranged from 50-200 years. Heavy fuel loading probably existed historically due to the productive nature of these sites, and diverse forests

were generally developed due to the variety of tree species present and their varying response to fire (Fisher and Bradley, 1987).

Stand replacing fires in 1910 initiated the even-aged stands of 80-90-year-old lodgepole pine that currently dominate the site, resulting in a very homogenous age class and canopy structure. Many of these trees are over mature and dying due to competition from other species as well as the Mountain Pine Beetle infestation. Nearly all (90%) of the project area is a single storied forest 80-90 years old with lodgepole pine being the dominant species in 70% of stands (DNRC SLI 2004). Mature Douglas-fir, western larch, ponderosa pine and Engelmann spruce occur in varying amounts.

The harvest entry in 1996 commercially thinned approximately 230 acres of the lodgepole pine, with a subsequent decline in stand condition as a result of Mountain Pine Beetle infestation. The harvest entry of 2007 to 2009 removed approximately 240 acres of lodgepole pine by utilizing selection and salvage harvest techniques. The remaining stand is composed of mostly western larch, ponderosa pine and Douglas fir in the overstory. Advanced regeneration of lodgepole pine, western white pine and western larch has produced a well-stocked understory. Due to the relatively young age of these stands and the severity of the 1910 fire, old-growth stands have not been identified on this site.

Mixed conifer stands within the project area are very heavily stocked (90-120 square feet of basal area per acre[1]). These stands are in good condition, though growth rates and tree vigor are beginning to decline due to competition for resources. Canopy closure approaches 100% in these stands.

The proposed action would reduce canopy closure and stocking of mature trees resulting in a more developed understory. The larger healthy western larch, ponderosa pine and Douglas fir would be retained on a 20 – 50 foot spacing as growing stock and seed source. Most of the lodgepole pine trees would be removed. Most of the older mature and over mature trees would be retained as wildlife trees and snag recruits.

There is potential for the introduction and spread of noxious weeds due to soil disturbance associated with timber harvest and road maintenance. An integrated weed management approach including prevention, revegetation, monitoring and treatment would reduce the possibility of noxious weed infestation. Contract stipulations would include washing of all machinery and inspection by the DNRC prior to delivery to the project area. Revegetation of disturbed sites would encourage desirable species. Monitoring for noxious weeds and herbicide treatment during and after project completion would address new infestations.

As a result, there would be low risk of direct, indirect or cumulative effects to quality of vegetation and vegetation communities.

[1] Basal area is defined as the cross sectional area of a tree stems 4.5 feet above the ground, measured in square feet. When calculated for every tree in a stand, it is commonly used as a relative measure of stand density.

8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:
Consider substantial habitat values and use of the area by wildlife, birds or fish. Identify direct, indirect, and cumulative effects to fish and wildlife.

Harvest units and prescriptions were designed to minimize impacts to wildlife and habitat. Appropriate mitigation measures would be implemented as recommended by the DNRC wildlife biologist, fisheries biologist and Fish, Wildlife and Parks biologists and as required by the Montana Administrative Rules for Forest Management. As a result, no direct, indirect or cumulative effects to terrestrial, avian and aquatic life and habitats would be expected. A detailed analysis can be found in attachment B.

9. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:
Consider any federally listed threatened or endangered species or habitat identified in the project area. Determine effects to wetlands. Consider Sensitive Species or Species of special concern. Identify direct, indirect, and cumulative effects to these species and their habitat.

The following list of issues and concerns was developed regarding wildlife species that are considered sensitive, threatened or endangered:

~There is concern that the proposed activities could alter forest connectivity, wildlife corridors and or habitats within linkage zones, which could affect wildlife movements across the landscape.

~There is concern that the proposed activities could alter cover, increase access, and reduce secure areas, which could affect grizzly bears by displacing them from important habitats and/or increasing risk to bears of human-caused mortality.

~There is concern that the proposed activities could negatively affect Canada lynx by altering lynx summer foraging habitat, winter foraging habitat, and other suitable habitat, rendering it unsuitable for supporting lynx.

~There is concern that the proposed activities could reduce the amount and/or quality of fisher habitats, which could alter fisher use of the area.

~The proposed activities could displace gray wolves from important habitats, particularly denning and rendezvous sites, and/or alter prey availability.

~There is concern that the proposed activities could reduce suitable nesting and foraging habitat for pileated woodpeckers, which could alter pileated woodpecker use of the area.

~There is concern that the proposed activities could remove forest cover on big game winter range, which could reduce the carrying capacity of the winter range.

After a detailed analysis, the following was determined (See Attachment B):

~Under the proposed Action Alternative, there would be a minor risk of direct, indirect and cumulative effects to forest habitat connectivity and wildlife movements due to human activity as discussed in the wildlife portion of Attachment B.

~Under the proposed Action Alternative, there would be a minor risk of direct, indirect and cumulative effects to grizzly bears due to human activity as discussed in the wildlife portion of Attachment B.

~Under the proposed Action Alternative, there would be a moderate risk of adverse direct and indirect effects but a minor risk of adverse cumulative effects to Canada lynx as discussed in the wildlife portion of Attachment B.

~Under the proposed Action Alternative, there would be a minor risk of adverse direct, indirect and cumulative effects to fishers as discussed in the wildlife portion of Attachment B.

~Under the proposed Action Alternative, there would be a low risk of direct, indirect and cumulative effects to gray wolves as discussed in the wildlife portion of Attachment B.

~Under the proposed action, there would be a minor risk of adverse direct, indirect and cumulative effects to pileated woodpeckers as discussed in the wildlife portion of Attachment B.

~Under the proposed action, there would be a minor risk of adverse direct, indirect and cumulative effects to big game winter range as discussed in the wildlife portion of Attachment B.

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10. HISTORICAL AND ARCHAEOLOGICAL SITES:
Identify and determine direct, indirect, and cumulative effects to historical, archaeological or paleontological resources.

These parcels were inventoried for historical and archaeological properties by the U.S. Forest Service and no sites of historical significance were discovered. Any significant sites discovered during the course of the project would be protected from disturbance by logging operations. As a result, there would be low risk of direct, indirect or cumulative effects to historical, archaeological or paleontological resources.

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11. AESTHETICS:
Determine if the project is located on a prominent topographic feature, or may be visible from populated or scenic areas. What level of noise, light or visual change would be produced? Identify direct, indirect, and cumulative effects to aesthetics.

The project area is approximately 3 miles northwest of Haugan, Montana. The project area is not visible from Interstate 90 and there are few residences which would be affected by the harvest activities.

The Packer Creek and Timber Creek roads provide access to the proposed harvest parcels. They are maintained by Mineral County and are used by a few full time residents and a few seasonal use cabins. Both roads are used by recreationalists, primarily during the fall hunting and winter snowmobiling seasons. The Haugan/Randolph Creek Loop Snowmobile Trail #1 parallels the Packer Creek road to a point where the trail intersects and overlays the Packer Creek road. The snowmobile trail may see periods of heavy use during the winter.

Alternative A: No Action

Under the proposed No Action Alternative, the stands would continue to deteriorate with the dead lodgepole pine continuing to fall to the ground creating a very heavy fuel load. This situation would discourage natural seedling regeneration while creating an opportunity for extreme fire behavior. The trees would continue to fall to the ground making travel difficult for animals and people. The forest would look very cluttered and unhealthy.

Alternative B: Action

Under the proposed Action Alternative, the majority of the lodgepole pine would be removed leaving a more open stand of western larch, ponderosa pine and Douglas fir. The affected stands would mainly be visible from the Timber Creek road which is less traveled than the Packer Creek road because it dead ends at a gate on private property. Therefore, there is low risk of direct, indirect or cumulative effects to aesthetics.

12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:

Determine the amount of limited resources the project would require. Identify other activities nearby that the project would affect. Identify direct, indirect, and cumulative effects to environmental resources.

No negative direct, indirect or cumulative effects are expected to occur as a result of the proposed project.

13. OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:

List other studies, plans or projects on this tract. Determine cumulative impacts likely to occur as a result of current private, state or federal actions in the analysis area, and from future proposed state actions in the analysis area that are under MEPA review (scoped) or permitting review by any state agency.

The DNRC recently acquired ownership of the proposed project parcels in sections 15 and 16 of T19N – R30W in the Lolo National Forest – DNRC Land Exchange. Another 40 acre parcel in section 17, T19N – R30W was also acquired by the DNRC, but due to access issues, was not included in the proposed project.

A timber sale was conducted in section 16, T19N – R30W in 2007 to 2009. This sale predated the Lolo Land Exchange, so only included the DNRC owned land at the time. A subsequent Best Management Practices audit determined there were no cumulative impacts from this project.

IV. IMPACTS ON THE HUMAN POPULATION

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" If no impacts are identified or the resource is not present.*

14. HUMAN HEALTH AND SAFETY:

Identify any health and safety risks posed by the project.

It is unlikely human health would be impacted by the proposed timber sale or associated activity. Safety considerations and temporary risks would increase for the professional contractors working within the sale area. Log truck traffic would increase, however safety concerns would be minimized by posting signs and requiring dust abatement measures if necessary. The proposed timber sale does not present any unusual safety considerations. The general public and local residents would not face increased health or long term safety hazards because of the proposed timber sale. No additional negative effects would be expected as a result of the proposed action. Therefore no significant direct, indirect or cumulative effects to human health and safety would be expected.

15. INDUSTRIAL, COMMERCIAL AND AGRICULTURE ACTIVITIES AND PRODUCTION:
Identify how the project would add to or alter these activities.

The proposed project would supply approximately 1.4 MMBF of sawlogs to local sawmills for the manufacture of various forest products which may include: lumber, posts and rails, chips and hog fuel.

16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:
Estimate the number of jobs the project would create, move or eliminate. Identify direct, indirect, and cumulative effects to the employment market.

The proposed action would create short term employment for a logging contractor. No significant direct, indirect or cumulative effects to the employment market would be expected.

17. LOCAL AND STATE TAX BASE AND TAX REVENUES:
Estimate tax revenue the project would create or eliminate. Identify direct, indirect, and cumulative effects to taxes and revenue.

The proposed action would create short term employment for a logging contractor who would in turn pay federal and state income taxes. Logs would likely be processed at local mills by mill employees who would pay income taxes. Due to the temporary nature of the project and limited amount of volume harvested, it is unlikely that the proposed action would have any direct, indirect or cumulative effects to taxes and revenue

18. DEMAND FOR GOVERNMENT SERVICES:
Estimate increases in traffic and changes to traffic patterns. What changes would be needed to fire protection, police, schools, etc.? Identify direct, indirect, and cumulative effects of this and other projects on government services

The proposed action would have minimal impacts on demand for government services. There would be short term impacts from increased traffic on county roads, but due to the relative small size of the project, it would be unlikely that the proposed action would have any direct, indirect or cumulative effects on government services.

19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:
List State, County, City, USFS, BLM, Tribal, and other zoning or management plans, and identify how they would affect this project.

There are no State, County, USFS, BLM, Tribal or other zoning or management plans which would affect this project.

20. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES:
Identify any wilderness or recreational areas nearby or access routes through this tract. Determine the effects of the project on recreational potential within the tract. Identify direct, indirect, and cumulative effects to recreational and wilderness activities.

The project area is used by the public primarily for hunting and snowmobiling. The open roads that go through the project are used primarily by people accessing Trust Lands and National Forest Lands. Mineral County Road Department maintains the two main roads (Packer Creek and Timber Creek) for

access to a few seasonal cabins and a few permanent residences. There is a developed snowmobile trail (Snowmobile Trail #1) running through part of section 16 which parallels the Packer Creek road. All proposed activities are specifically designed not to interfere with the snowmobile trail except where it crosses the Timber Creek road. Adequate signage and truck driver awareness would be required if the project is winter logged.

No direct, indirect or cumulative effects to this recreational access or year round residences would be expected as a result of the proposed project.

21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:
Estimate population changes and additional housing the project would require. Identify direct, indirect, and cumulative effects to population and housing.

The proposed action would likely provide temporary employment for local logging contractors and their employees. As a result, there would be no anticipated changes to population and housing. Therefore no negative direct, indirect or cumulative effects are expected to occur as a result of the proposed project.

22. SOCIAL STRUCTURES AND MORES:
Identify potential disruption of native or traditional lifestyles or communities.

No native or traditional communities have been identified near the project area.

23. CULTURAL UNIQUENESS AND DIVERSITY:
How would the action affect any unique quality of the area?

These parcels were fully inventoried by the U.S. Forest Service with no archaeological or historic properties identified.

24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:
Estimate the return to the trust. Include appropriate economic analysis. Identify potential future uses for the analysis area other than existing management. Identify direct, indirect, and cumulative economic and social effects likely to occur as a result of the proposed action.

Alternative A: No Action

No revenue would be generated in support of the Public Buildings or Common School Trusts and no Forest Improvement fees would be collected as a result of this alternative. No improvements to roads or infrastructure would be completed in association with the project. Trees would continue to die causing increased fuel loading resulting in increased potential fire intensity.

Alternative B: Action

The proposed harvest would contribute approximately $64,000 (4,269 tons estimated at $15.00/ton) in revenue to the Public Building Trust, $69,500 (4,624 tons estimated at $15.00/ton) to the Common

School Trust and $32,815 (8,893 tons X $3.69/ton) in Forest Improvement fees. The total return to the trust accounts would be approximately $133,500.

Improvements associated with the proposed project include grass seeding, improved forest health and reduced fuel loading through the removal of dead, dying and diseased trees. Weed and slash treatments could require Forest Improvement and operating expenditures of approximately $1,000.

Forest management would likely continue as the primary use of the project area. Tree planting and precommercial thinning of the understory would likely occur within the next decade, requiring investment of Forest Improvement funds. There are no plans for alternative management of the project area at this time.

EA Checklist Prepared By:	Name: Jeff Rupkalvis	Date: May 15, 2013
	Title: Forest Management Supervisor	

V. FINDING

25. ALTERNATIVE SELECTED:

Alternative B the Action Alternative.

26. SIGNIFICANCE OF POTENTIAL IMPACTS:

Implementation of Alternative B the Action Alternative is not likely to result in significant impacts to the environment.

27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

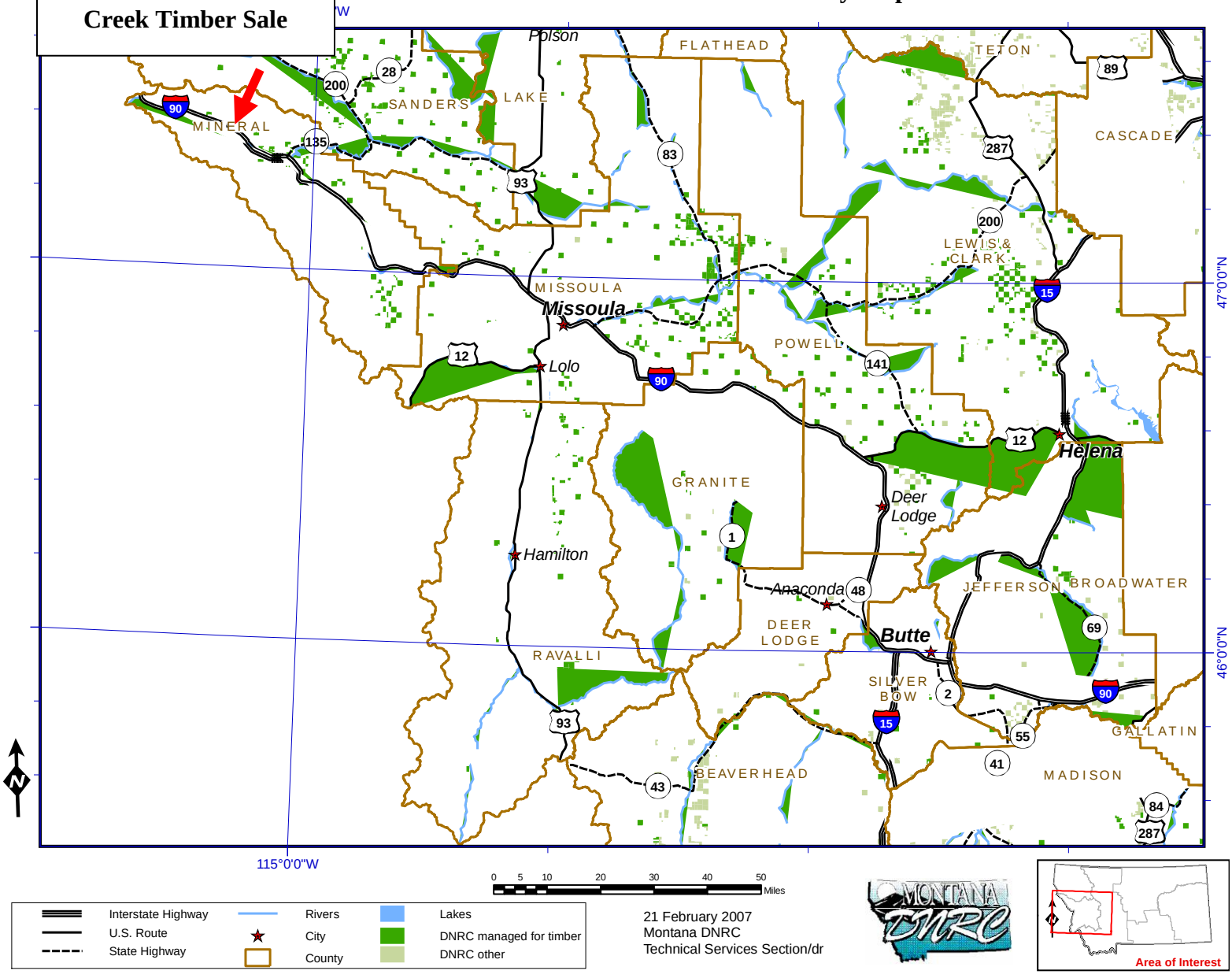
[ ] EIS [ ] More Detailed EA [X] No Further Analysis

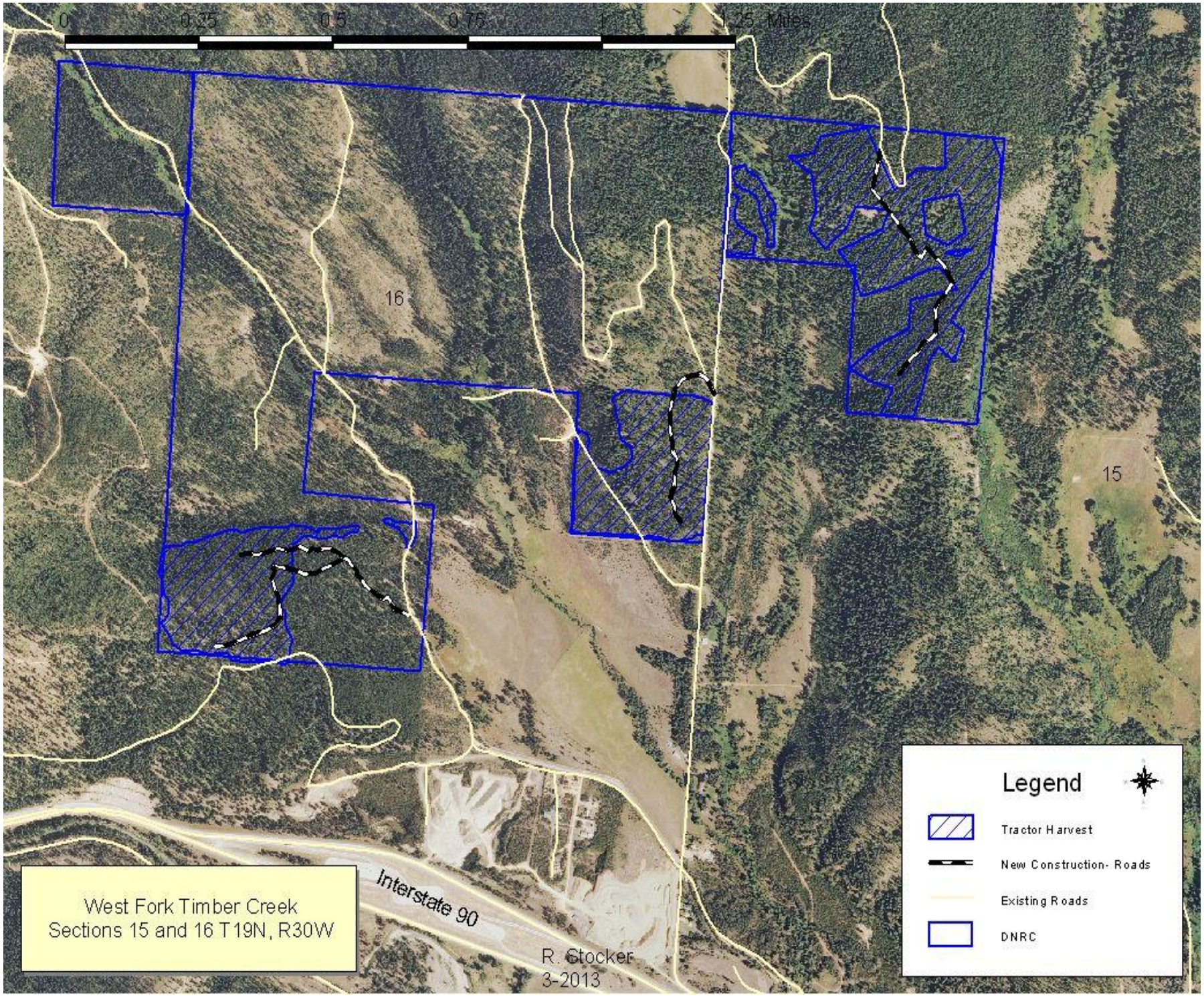
EA Checklist Approved By:	Name: Jonathan Hansen Title: Missoula Unit Manager
Signature:	Date: May 15, 2013

ATTACHMENT A
MAPS

West Fork Timber Creek Timber Sale

West Fork Timber Creek Timber Sale Vicinity Map




0
0.25
0.5
0.75
1
1.25 Miles
16
15
Interstate 90
West Fork Timber Creek
Sections 15 and 16 T19N, R30W
R. Stocker
3-2013
Legend
Tractor Harvest
New Construction- Roads
Existing Roads
DNRC

ATTACHMENT B
Watershed/Soils/Noxious Weeds/Fisheries and Wildlife Analysis

West Fork Timber Creek Timber Sale Wildlife Analysis

Issues and Concerns

There is concern that the proposed activities could alter forested connectivity, wildlife corridors and or habitats within linkage zones, which could affect wildlife movements across the landscape.

There is concern that the proposed activities could alter cover, increase access, and reduce secure areas, which could affect grizzly bears by displacing them from important habitats and/or increasing risk to bears of human-caused mortality.

There is concern that the proposed activities could negatively affect Canada lynx by altering lynx summer foraging habitat, winter foraging habitat, and other suitable habitat, rendering it unsuitable for supporting lynx.

There is concern that the proposed activities could reduce the amount and/or quality of fisher habitats, which could alter fisher use of the area.

The proposed activities could displace gray wolves from important habitats, particularly denning and rendezvous sites, and/or alter prey availability.

There is concern that the proposed activities could reduce suitable nesting and foraging habitat for pileated woodpeckers, which could alter pileated woodpecker use of the area.

There is concern that the proposed activities could remove forest cover on big game winter range, which could reduce the carrying capacity of the winter range.

Issues Eliminated from Further Study

The following species were considered but eliminated from detailed study due to lack of habitat present: bald eagle, black-backed woodpecker, Coeur d'Alene salamander, Columbian sharp-tailed grouse, common loon, flammulated owl, harlequin duck, mountain plover, northern bog lemming, peregrine falcon, and Townsend's big-eared bat. Additionally elk security habitat does not appear to exist in the project area due to proximity to open roads. Thus there would be a low risk of adverse direct, indirect, or cumulative effects as a result of either alternative.

Suggested Wildlife Mitigations

- A DNRC biologist will be consulted if a threatened or endangered species is encountered to determine if additional mitigations that are consistent with the administrative rules for managing threatened and endangered species (ARM 36.11.428 through 36.11.435) are needed.
- Motorized public access will be restricted at all times on restricted roads that are opened for harvesting activities; motorized public access would revert to existing levels following harvesting. Efforts to discourage additional motorized access (legal and illegal) by reclaiming temporary roads and obstructing skid trails would benefit several wildlife species.
- Snags, snag recruits, and coarse woody debris will be managed according to *ARM 36.11.411* through *36.11.414*, particularly favoring western larch and ponderosa pine. Clumps of existing snags could be maintained where they exist to offset areas without sufficient snags. Coarse woody debris retention would emphasize retention of downed logs of 15-inch diameter or larger.

- Contractors and purchasers conducting contract operations will be prohibited from carrying firearms while on duty.
- Food, garbage, and other attractants will be stored in a bear-resistant manner.
- Retention of patches of advanced regeneration of shade-tolerant trees, such as grand-fir, in unit 16-2 would break-up site distances, provide horizontal cover, and provide forest structural attributes preferred by snowshoe hares and lynx.
- Provide connectivity for fisher, Canada lynx, grizzly bears, and a host of other species by maintaining corridors of unharvested and/or lighter harvested areas along riparian areas, ridge tops, and saddles.

Affected Environment

Description of Relevant Affected Resources

Wildlife

Forested Habitat Connectivity and Wildlife Movements

Connectivity of forest cover between adjacent patches is important for promoting movements of species that are hesitant to cross non-forested areas and other openings. Effective corridors tend to be those that are relatively wide, unfragmented, diverse, and associated with riparian areas (Fischer and Fischenich 2000). Width of the travel corridor tends to determine the efficacy of the corridor for individual species. In general, a wider corridor would be more effective and provide for more species than a narrower one. Riparian areas and ridges often play an important role in providing connective corridors. Expanding on this, linkage zones are areas "between larger blocks of habitat where animals can live at certain seasons and where they can find the security they need to successfully move between these larger habitat blocks" (Servheen et al. 2003). Linkage zones are important because they provide for dispersal and gene flow among larger areas of suitable habitats. As such, both corridors and linkage zones can become compromised through human management and environmental changes (e.g., fires or floods).

The project area currently contains approximately 344 acres of mature stands (100-plus years in age) of western larch/Douglas-fir and lodgepole pine stands that have a reasonably closed canopy. Currently, closed and open canopied forested habitats cover most of the project area, facilitating some use by those species requiring connected-forested conditions. The project area is part of the Weigh Station wildlife movement area (Clough 2003). The project area is also included in a potential linkage zone that provides broad-scale landscape connectivity for forest carnivores (grizzly bear, Canada lynx, and wolverine) from the Cabinet/Yaak area to the Selway-Bitterroot Mountains, and was specifically identified as an area for linkage across Highway 90 (Servheen et al. 2003). Within these linkage zones, Servheen recommends the following to maintain the effectiveness of these areas for wildlife movement: 1) no additional site developments such as campgrounds, boat ramps or trailheads where human activity and human-related attractants like garbage and foods are concentrated; 2) no increase in motorized access routes or motorized use areas; and 3) maintenance or enhancement of visual cover in these areas so as to make wildlife more secure when they move through such areas.

THREATENED AND ENDANGERED SPECIES

Grizzly Bears

Grizzly bears are native generalist omnivores that use a diversity of habitats found in western Montana. Preferred grizzly bear habitats are meadows, riparian zones, avalanche chutes, subalpine forests, and big game winter ranges, all of which provide seasonal food sources. The search for food drives grizzly bear movements, with bears moving from low elevations in spring to higher elevations through the summer and early fall, as fruits ripen throughout the year. Primary threats to grizzly bears are related to human-bear conflicts, habituation to unnatural foods near high-risk areas, and long-term habitat loss associated with human development (Mace and Waller 1997). Forest-management activities may affect grizzly bears by altering cover and/or by increasing human access into secure areas by creating roads (Mace et al. 1997). These actions could lead to the displacement of grizzly bears from preferred areas and/or result in an increased risk of human-caused mortality by bringing humans and bears closer together and/or making bears more detectable, which can increase the risk of bears being illegally shot. Displacing bears from preferred areas may increase their energetic costs, which may, in turn, lower their ability to survive and/or reproduce successfully.

The project area is approximately 14 miles south of the Cabinet-Yaak grizzly bear recovery area, which is known to have a small grizzly bear population. Additionally, the project area is outside of the 'occupied habitat' area as mapped by grizzly bear researchers and managers to address increased sightings and encounters of grizzly bears in habitats outside of recovery zones (Wittinger 2002). Grizzly bears have not been documented in the project area, but use of the project area is possible. Grizzly bears generally use different habitats relative to season. The project area contains marginally suitable habitats, and primarily provides low elevation forested areas that could be used during the spring, but also includes riparian areas and big game winter range. Summer or autumn habitat values are fairly low in the area. The cumulative effects analysis area is approximately 30,511 acres and includes the area along the St. Regis River between the lower Twelvemile drainage through Saltese. DNRC manages approximately 6.6% (2,010 acres) of the cumulative effects analysis area.

Managing human access is a major factor in management for grizzly bear habitat. There are 2 open roads bisecting the project area, yielding a fairly high (1.4 mi. / sq. mi.) open road density for the project area. Similarly, open road densities are moderately high in the cumulative effects analysis area (2.09 mi. /sq. mi., simple linear calculation). No grizzly bear security habitats exist ($\geq$ 0.3 miles from roads receiving motorized use and $\geq$2,500 acres in size) in the project area or cumulative effects analysis area. Hiding cover exists in the forested portions of the project area (roughly 25,377 acres); grizzly bear hiding cover has been reduced on roughly 5,134 acres due to recent timber management, residential clearing, and other land cover changes in the cumulative effects analysis area. Across the cumulative effects analysis area, the reductions in hiding cover, the elevated levels of human disturbance, and the mosaic of available habitats likely limits the overall usefulness of portions of the cumulative effects analysis area for grizzly bears.

Canada Lynx

Canada lynx are associated with subalpine forests, generally between 4,000 to 7,000 feet in elevation in western Montana (Ruediger et al. 2000). The proposed project area ranges from approximately 3,240 to 3,720 feet in elevation and is dominated by western larch, Douglas-fir, lodgepole pine, and mixed conifer stands. Lynx habitat in western Montana consists primarily of stands that provide habitat for snowshoe hares, either dense, young coniferous stands or dense, mature forested stands. Lynx in western Montana preferred mature, multi-storied stands with dense horizontal cover year-

round; during the summer lynx also selected earlier successional stands with a high horizontal cover (Squires et al. 2010). For denning sites, the primary component appears to be abundant large woody debris, particularly in the form of downed logs, root wads, slash piles, and live trees (Squires et al. 2008). These conditions are found in a variety of climax vegetation habitat types, particularly within the subalpine fir series (Pfister et al. 1977). Historically, high intensity, stand-replacing fires of long fire intervals (150 to 300 years) occurred in continuous dense forests of lodgepole pine, subalpine fir, and Engelmann spruce. These fires created extensive even-aged patches of regenerating forest intermixed with old stands that maintained a mosaic of snowshoe hare and lynx habitat.

Approximately 630 acres of lynx habitat occur in the project area, which is dominated by foraging and other suitable lynx habitats (largely forested lands that provide cover to facilitate movement). Connectivity of forested habitats in the project area is only partially intact due to the mosaic of habitats present, ownership patterns, past management, and presence of open roads. The cumulative effects analysis area is approximately 30,511 acres and includes the area along the St. Regis River between the lower Twelvemile drainage through Saltese. DNRC manages approximately 6.6% (2,010 acres) of the cumulative effects analysis area. On DNRC-managed lands within the cumulative effects analysis area, an additional 1,208 acres of potential lynx habitats exist, which are dominated by foraging, with smaller components of other suitable lynx habitats, younger aged stands for foraging, and temporary non-suitable lynx habitats. On other ownerships, there are roughly 14,085 acres of forested stands dominated by Douglas-fir and lodgepole pine with ≥40% canopy closure of ≥5 inch trees across the cumulative effects analysis area; the majority of those stands could be suitable lynx habitats and probably include considerable winter foraging habitats. Additionally summer foraging habitats likely exists on a portion of the 15,787 acres of shrubs, herbaceous, and poorly stocked forested stands in the cumulative effects analysis area.

SENSITIVE SPECIES

Fisher

Fishers are a mid-sized forest carnivore whose prey includes small mammals such as voles, squirrels, snowshoe hares, and porcupines, as well as birds (Powell and Zielinski 1994). They also take advantage of carrion and seasonally available fruits and berries (Foresman 2001). Fishers use a variety of successional stages, but are disproportionately found in stands with dense canopies (Powell 1982, Johnson 1984, Jones 1991, Heinemeyer and Jones 1994) and avoid openings or young forested stands (Buskirk and Powell 1994). However, some use of openings may occur for short hunting forays or if sufficient overhead cover (shrubs, saplings) is present. Fishers appear to be highly selective of stands that contain resting and denning sites and tend to use areas within 150 feet of water (Jones 1991). Resting and denning sites are found in cavities of live trees and snags, downed logs, brush piles, mistletoe brooms, squirrel and raptor nests, and holes in the ground. Forest-management considerations for fisher involve providing for resting and denning habitats near riparian areas while maintaining travel corridors.

There are approximately 25 acres of potential riparian fisher habitats and 277 acres of potential upland habitats in the project area. The cumulative effects analysis area is approximately 30,511 acres and includes the area along the St. Regis River between the lower Twelvemile drainage through Saltese. DNRC manages approximately 6.6% (2,010 acres) of the cumulative effects analysis area; roughly 590 acres of upland fisher habitats and 38 acres of riparian habitats exist on DNRC-managed lands in the cumulative effects analysis area, including the habitats found in the project area. On other ownerships,

there are roughly 14,085 acres of forested stands dominated by Douglas-fir and lodgepole pine with ≥40% canopy closure of ≥5 inch trees across the cumulative effects analysis area; some of those stands would likely be suitable fisher habitats, particularly along the riparian areas associated with the numerous streams that exist in the cumulative effects analysis area. Much of the 15,787 acres of shrubs, herbaceous, and poorly stocked forested stands in the cumulative effects analysis area would not be expected to be suitable fisher habitats for some time, if ever.

Gray Wolf

Wolves are a wide-ranging, mobile species that occupy a wide variety of habitats that possess adequate prey and minimal human disturbance, especially at den and/or rendezvous sites. Wolves are opportunistic carnivores that frequently take vulnerable prey (including young individuals, older individuals, and individuals in poor condition). In general, wolf densities are positively correlated to prey densities (Fuller et al. 1992, Oakleaf et al. 2006). In Montana, wolves prey primarily on white-tailed deer and elk (Kunkel et al. 1999, Arjo et al. 2002). Thus, reductions in big game populations and/or winter range productivity could indirectly be detrimental to wolf populations.

Wolves typically den during late April in areas with gentle terrain near a water source (valley bottoms), close to meadows or other openings, and near big game wintering areas. When the pups are 8 to 10 weeks old, wolves leave the den site and start leaving their pups at rendezvous sites while hunting. These sites are used throughout the summer and into the fall. Disturbance at den or rendezvous sites could result in avoidance of these areas by the adults or force the adults to move the pups to a less adequate site. In both situations, the risk of pup mortality increases.

Big game species are abundant in the project area much of the year; winter range exists in the project area for elk. Several landscape features commonly associated with denning and rendezvous sites occur in the project area, such as areas with gentle terrain near a water source (valley bottoms), openings, and proximity to big game wintering areas. Wolves have not been documented in the project area, but 3-4 wolf packs have been in the vicinity in the past, including the Silver Lake, DeBorgia, Mineral Mountain, and Mullen packs. Over the last 5 years, these packs have been dynamic, with changes to home ranges, numbers of wolves, and reproductive status. Collectively, given the uncertainty associated with these packs, some use of the project area by wolves could be occurring for breeding, hunting, or other life requirements. No known den or rendezvous sites to occur in the project area, but the possibility of den or rendezvous sites occurring in the project area exists.

The cumulative effects analysis area is approximately 30,511 acres and includes the area along the St. Regis River between the lower Twelvemile drainage through Saltese. Within this cumulative-effects analysis area, big game species are fairly abundant and winter range for deer, elk, and moose are fairly widespread. Numerous landscape features commonly associated with denning and rendezvous sites, including meadows and other openings near water and in gentle terrain, occur in the cumulative-effects analysis area. Past harvesting and human developments have altered big game and wolf habitats in the cumulative effects analysis area.

Pileated Woodpecker

Pileated woodpeckers are one of the largest woodpeckers in North America and excavate the largest cavities of any woodpecker. Preferred nest trees are large diameter western larch, ponderosa pine, cottonwood, and quaking aspen trees and snags, usually 20 inches dbh and larger. Pileated woodpeckers primarily eat carpenter ants, which inhabit large downed logs, stumps, and snags. Aney and McClelland (1985) described pileated nesting habitat as "...stands of 50 to 100 contiguous acres,

generally below 5,000 feet in elevation with basal areas of 100 to 125 square feet per acre and a relatively closed canopy." The feeding and nesting habitat requirements, including large snags or decayed trees for nesting and downed wood for feeding, closely tie these woodpeckers to mature forests with late-successional characteristics. The density of pileated woodpeckers is positively correlated with the amount of dead and/or dying wood in stands (McClelland 1979).

In the project area, potential pileated woodpecker nesting habitat exists on approximately 149 acres. These nesting habitats are dominated by Douglas-fir and mixed conifer types. Additionally, 396 acres of sawtimber stands dominated by western larch/Douglas-fir and lodgepole pine exist in the project area, which are potential foraging habitats. Pileated woodpeckers have been seen and/or heard in the project area during field visits and may be nesting on the parcel. The cumulative effects analysis area encompasses the project area and lands within a one mile radius. The only DNRC-managed parcels in the cumulative effects analysis area are found in the project area; potential pileated woodpecker nesting and foraging habitats likely exist on much of the 2,565 acres of forested habitats on other ownerships in the cumulative effects analysis area. Much of the 3,469 acres of open forest, shrubs, herbaceous areas, poorly stocked forested stands, and recently harvested stands on other ownerships in the cumulative effects analysis area is likely too open to be useful to pileated woodpeckers.

BIG GAME

Big Game Winter Range

Winter ranges enable big game survival by minimizing the effects of severe winter weather conditions. Winter ranges tend to be relatively small areas that support large numbers of big game, which are widely distributed during the remainder of the year. These winter ranges have adequate midstory and overstory to reduce wind velocity and intercept snow. The effect is that temperatures are moderated and snow depths are lowered, which enables big game movement and access to forage with less energy expenditure than in areas with deeper snow and colder temperatures. Snow depths differentially affect big game; white-tailed deer are most affected, followed by mule deer, elk, and then moose. Thus, removing cover that is important for wintering big game through forest management activities can increase their energy expenditures and stress in winter, but may increase forage production for use on summer range. Reductions in cover could ultimately result in a reduction in winter range carrying capacity and subsequent increases in winter mortality within local big game herds.

Montana Department of Fish, Wildlife, and Parks identified elk (176 acres) winter range in the project area. This winter range is part of a larger winter range in the area. Mature Douglas-fir, with lesser amounts of ponderosa pine, lodgepole pine, and mixed conifer stands in the project area are providing attributes facilitating use by wintering big game. Approximately 323 acres of the project area appear to be providing snow intercept and thermal cover attributes. Evidence of non-winter use by deer and elk was noted throughout the project area during field visits.

A variety of stands across the 205,962-acre winter range, used for the cumulative effects analysis area, is presently providing thermal cover and snow intercept for big game. In the recent past, harvesting within this area has reduced thermal cover and snow intercept; ongoing harvesting across the winter range could continue altering these attributes while potentially disturbing wintering big game. Portions of the cumulative effects analysis area have been converted to agriculture and other human developments and would not be expected to provide thermal cover or snow intercept in the future. Human disturbance within the winter range is associated with residential development, agricultural clearing, recreational snowmobile use, commercial timber management, and the numerous highways and secondary roads.

Environmental Consequences

Wildlife

Forested Habitat Connectivity and Wildlife Movements

Direct and Indirect Effects of the No-Action Alternative to Forested Habitat Connectivity and Wildlife Movement

No direct or indirect effects to forested habitat connectivity and wildlife movements would be expected since: 1) no changes to existing stands providing forested cover that may be functioning as corridors, including riparian areas, saddles, and ridgelines would occur; 2) no changes to human developments, motorized access, or visual screening would occur, and 3) no alterations to existing corridors or habitats within linkage zones would be anticipated.

Cumulative Effects of the No-Action Alternative to Forested Habitat Connectivity and Wildlife Movement

No appreciable changes to existing stands would be anticipated. Stands providing forested cover that may be functioning as corridors, including riparian areas, saddles, and ridgelines, would not be altered. Similarly, no changes in habitats within the linkage zone would be anticipated. Past harvesting has reduced the amount of mature, forested habitats in portions of the cumulative effects analysis area; however, continued successional advances are moving stands toward mature forests. This alternative would continue to contribute to the mature forested stands in the cumulative-effects analysis area. No changes in human developments, motorized access, or visual screening would occur. No changes in wildlife use would be expected. Thus, no cumulative effects to forested habitat connectivity and wildlife movements would be expected since: 1) no changes to existing stands would occur; 2) no changes to human developments, motorized access, or visual screening would occur, and 3) no alterations to existing corridors or habitats in linkage zones would be anticipated.

Direct and Indirect Effects of the Action Alternative to Forested Habitat Connectivity and Wildlife Movement

Approximately 31 acres of mature western larch and mixed conifer stands with a closed canopy would be harvested. The majority of those acres would receive a treatment that would open the stands up appreciably, which would reduce habitat for those species relying on mature, closed-canopied forested habitats. Although these treatments would create fairly open stands that would not likely be used by wildlife species that use mature stands to move through the landscape, functional corridors, particularly along ridges, draws, and other topographic features, would be retained. The proposed treatments could also modify suitable habitats in the larger linkage zone, but would not be expected to appreciably affect use of the linkage zone by those wildlife needing those resources. Additionally, the only permanent human development constructed with this alternative would be roughly 1.54 mi of new temporary road, but this would not be expected to concentrate human activity beyond the proposed activities. Furthermore contract stipulations would minimize the presence of human-related attractants for the duration of the proposed activities. No changes in motorized public access would occur in the project area. Some changes in visual screening would occur within individual units, but the combination of irregular-shaped units, topography, and considerable unharvested patches throughout the project area would minimize the effect of the reductions in visual screening. The addition of early successional habitats intermixed in the linkage zone could create additional foraging resources for

several of the species while also increasing visual screening on those areas in the near-term. Thus, a minor risk of adverse direct and indirect effects to forested habitat connectivity and wildlife movements would be expected since: 1) proposed activities could reduce forested cover in a portion of the project area, but functional corridors would be retained; 2) minor changes in human developments would occur, but no changes in human developments that would concentrate human activity or human-related attractants would occur; 3) no changes to motorized human access would occur; and 4) visual screening in portions of the project area would be reduced, but considerable visual screening would be retained across the project area.

Cumulative Effects of the Action Alternative to Forested Habitat Connectivity and Wildlife Movement

Proposed harvesting could reduce forested habitats that may be serving as corridors or suitable habitats within the larger linkage-zone. Across the cumulative effects analysis area a variety of stands are providing for wildlife movements. The proposed activities would not appreciably alter the ability of the linkage zone to meet habitat needs for those wildlife species that need linkage zones. No appreciable changes in the presence of human developments would occur, particularly no changes in the presence of human-related attractants or concentrations of human activities beyond the short duration of proposed activities. No changes to motorized public access to the cumulative effects analysis area would occur. Negligible reductions in visual screening in a small portion of the cumulative effects analysis area would occur, which would not appreciably alter wildlife use of the area. Thus, a minor risk of adverse cumulative effects to forested habitat connectivity and wildlife movements would be expected since: 1) proposed activities could reduce forested cover in a small portion of the cumulative effects analysis area, but functional corridors would exist; 2) negligible changes in human developments would occur, but no changes in human developments that would concentrate human activity or human-related attractants would occur; 3) no changes to motorized public access would occur; and 4) visual screening in a small portion of the cumulative effects analysis area would be reduced, but considerable visual screening would persist across the cumulative effects analysis area.

Threatened and Endangered Species

Grizzly Bear

Direct and Indirect Effects of the No-Action Alternative to Grizzly Bears

No direct or indirect effects to grizzly bears would be anticipated since: 1) no disturbance or displacement would be expected, 2) no appreciable changes in hiding cover would occur, 3) security habitat would not be altered, and 4) no changes in long-term open-road densities would be anticipated.

Cumulative Effects of the No-Action Alternative to Grizzly Bears

No appreciable changes to existing habitats would be anticipated; advances in succession within those recently harvested stands could improve hiding cover and potentially foraging habitats for grizzly bears. Use of the cumulative effects analysis area by grizzly bears would not be expected to change from present levels. Thus, no further adverse cumulative effects to grizzly bears would be anticipated since: 1) no changes in human disturbance levels would be expected; 2) no changes to open road density would occur; 3) no further modifications to hiding cover would occur; and 4) no changes to security habitats would be expected.

Direct and Indirect Effects of the Action Alternative to Grizzly Bears

This alternative might affect grizzly bears directly through increased road traffic, noise, and human activity, and indirectly by altering the amount of hiding cover and forage resources. Activities in grizzly bear habitats reduce grizzly bear security, possibly resulting in increased stress and/or energy expenditure to endure the disturbance or to move from the area. These disturbances would only be present during harvesting operations; therefore, the season of disturbance is important in addressing effects to grizzly bears. Proposed harvesting could occur when soil conditions are dry or frozen, which could be either during the denning or the non-denning period for grizzly bears. If activities were to occur during the denning period, no direct effects to grizzly bears would be anticipated. Some disturbance of grizzly bears could be possible with any activities that may occur during the non-denning period. Use of the project area by grizzly bears would likely be the greatest during the spring and early summer; efforts to avoid harvesting during the spring period (April 1 –June 15) would further reduce the likelihood of disturbing or displacing grizzly bears. Overall, the proposed activities would occur in areas where low levels of grizzly bear use would be anticipated and would likely occur during the time periods when grizzly bears would not be expected to be using the area, leading to negligible disturbance and displacement of grizzly bears.

Hiding cover, defined as vegetation that will hide 90 percent of a grizzly bear at a distance of 200 feet, would be modified and partially reduced on roughly 126 acres in the short-term. Some hiding cover in the form of brush, shrubs, and sub-merchantable trees would persist in several of the units, albeit at a reduced level from the existing condition; hiding cover would increase through time as young trees and shrubs regenerate over the next 5 to 10 years. Security habitat would not be entered or altered with this alternative.

Approximately 1.54 miles of new, restricted roads would be constructed with the proposed activities. No changes in open road density or motorized public access would be anticipated. Some increases in non-motorized human access could occur on the newly constructed roads. Thus, a minor risk of adverse direct or indirect effects to grizzly bears would be anticipated since: 1) a low potential for disturbance and displacement would be anticipated; 2) hiding cover would be modified in a portion of the project area, but would remain in portions of the project area, and would be expected to recover in the short-term; 3) no changes to security habitats would be expected; and 4) no changes to long-term open road density would be anticipated.

Cumulative Effects of the Action Alternative to Grizzly Bears

The proposed project could temporarily increase human disturbance to grizzly bears within a portion of the cumulative effects analysis area for any activities that may be conducted during the non-denning period. Proposed activities would occur in a portion of the cumulative effects analysis area already experiencing some human disturbance, and away from the more remote portions of the cumulative effects analysis area that are more likely to be used by grizzly bears. Collectively, minor short-term

(2-4 years) increases in human disturbance would be anticipated in a portion of the cumulative effects analysis area, but again would largely occur during the periods when bears would not be using the area or would occur during the denning period. Continued use of the cumulative effects analysis area by grizzly bears would be anticipated at levels similar to present levels. Modifications to existing hiding cover would be additive to the reductions from past timber harvesting and any ongoing harvesting, as well as more permanent land-cover changes in the cumulative effects analysis area; however, portions of the cumulative effects analysis area are currently providing hiding cover. Early successional stages of vegetation occurring in harvest units could provide foraging opportunities that do not exist in some mature stands. No changes in long-term open-road density would be anticipated; a slight increase in non-motorized access to a small portion of the cumulative effects analysis area could occur. Thus, a minor risk of adverse cumulative effects to grizzly bears would be anticipated since: 1) minor increases in human disturbance levels in the short-term would be expected within a small portion of the cumulative effects analysis area; 2) hiding cover would be modified in the short-term on a small portion of the cumulative effects analysis area, but would be expected to recovery fairly rapidly; 3) no changes in long-term open road density would occur, and 4) no changes to security habitats would be expected.

Canada Lynx

Direct and Indirect Effects of the No-Action Alternative to Canada Lynx

In the short-term, no changes in lynx habitat elements would be expected in the project area. In the longer-term, barring any major natural disturbances, natural succession would advance several classes forward, generally improving several classes of lynx habitats; however, summer foraging habitats would continue to be absent from the project area. Winter foraging habitats would be expected to remain at similar levels, or increase in the future, as shade-tolerant trees develop in the understory and coarse woody debris accumulates through time due to natural events. Landscape connectivity would not be altered. Thus, a negligible risk of adverse direct and indirect effects to Canada lynx would be expected since: 1) existing winter foraging habitats would persist; 2) summer foraging habitats would continue to be absent without disturbance; 3) the amount of temporary non-suitable habitats would not increase; and 4) landscape connectivity would not be altered.

Cumulative Effects of the No-Action Alternative to Canada Lynx

No appreciable change in lynx habitats in the cumulative effects analysis area would occur, except the continued maturation of stands. Winter foraging habitats would be expected to improve in the future as shade-tolerant trees continue to develop in the understory, coarse woody debris accumulates through time due to natural events, and, in general, stands continue maturing out of summer foraging and other suitable habitats. No appreciable changes to landscape connectivity would be anticipated. Thus, a negligible risk of adverse cumulative effects to lynx would be expected since: 1) winter foraging habitats would persist in the cumulative effects analysis area; 2) summer foraging habitats would continue maturing and longer-term availability of summer foraging habitats would likely decline without disturbance; 3) no changes in the amount of temporary non-suitable habitat would occur; and 4) landscape connectivity would not be altered.

Direct and Indirect Effects of the Action Alternative to Canada Lynx

Approximately 124 acres of lynx foraging and other suitable habitats (20% of lynx habitats in the project area) would be altered with proposed activities. Roughly 81 acres of foraging habitats and 43 acres of other suitable habitats would be altered with the proposed treatments. Approximately 65 of

those acres (49 acres foraging, 16 acres other suitable habitats) would be converted to temporary non-suitable lynx habitats; roughly 32 acres of winter foraging habitats would be converted to other suitable lynx habitats and an additional 27 acres of other suitable lynx habitats would be modified, but would remain as other suitable habitat. The younger-aged stands created with this alternative could provide young foraging/summer foraging habitats into the future, as tree seedlings and shrubs recover and begin providing habitats for snowshoe hares. Retention of patches of advanced regeneration of shade-tolerant trees, such as grand-fir, in unit 16-2 would break-up sight distances, provide horizontal cover, and provide forest structural attributes preferred by snowshoe hares and lynx. The total amount of lynx habitats in the project area in the temporary non-suitable lynx habitat class would increase to roughly 16%. Negligible alterations to forested connectivity would occur, but overall connectivity would be maintained with several corridors being retained along riparian areas, draws, ridges, and other topographic features. Collectively, a moderate risk of adverse direct and indirect effects to Canada lynx would be expected since: 1) foraging habitats would be reduced; 2) younger-aged foraging habitats could develop in portions of the project area; 3) the amount of the project area in the temporary non-suitable lynx habitat category would increase to roughly 16%; and 4) connectivity could be slightly modified, but overall connectivity would be maintained.

Cumulative Effects of the Action Alternative to Canada Lynx

Within the cumulative-effects analysis area, lynx habitats would continue to persist. Reductions in foraging coupled with the increases in temporary non-suitable habitats and slight increases in other lynx habitats within a portion of the cumulative effects analysis area managed by DNRC could slightly decrease the quality of the lynx habitats in the cumulative effects analysis area. Within the cumulative effects analysis area, the extensive forested habitats would be expected to continue providing suitable lynx habitats, which likely includes considerable foraging habitats. Near-term increases in younger foraging habitats would be anticipated with the proposed harvesting within a portion of the cumulative effects analysis area and would be additive to the potential foraging habitats that likely exist on other ownerships in the cumulative effects analysis area. Anticipated reductions in lynx habitats would be additive to past losses from timber harvesting and other habitat modifications; likewise, increases in temporary non-suitable lynx habitats would be additive to recently converted lynx habitats due to timber harvesting and other habitat modifications. A small increase in the amount of the cumulative effects analysis area that is in the temporary non-suitable lynx habitats would occur; however much of the lynx habitats would be in a usable state for lynx. Forest connectivity would not be appreciably altered within the cumulative effects analysis area. Thus, a minor risk of adverse cumulative effects to Canada lynx would be expected since: 1) adequate foraging habitats would persist; 2) younger foraging/summer foraging habitats would continue developing for the next 10 to 30 years; 3) a small increase in the amount of the cumulative effects analysis area in the temporary non-suitable habitat category would occur, but most of the lynx habitats would be in a usable state for lynx; and 4) negligible alterations in landscape connectivity would occur, but would not prevent lynx movements.

Sensitive Species

Fisher

Direct and Indirect Effects of the No-Action Alternative to Fisher

No direct and indirect effects to fisher would be expected since: 1) no changes to existing habitats would be anticipated; 2) landscape connectivity would not be altered further; 3) no appreciable

changes to snags, snag recruits, and coarse woody debris levels would be anticipated; and 4) no changes to human access or the potential for trapping mortality would be anticipated.

Cumulative Effects of the No-Action Alternative to Fisher

No further cumulative effects to fishers would be anticipated since: 1) no changes to existing habitats on DNRC-managed lands would occur; 2) landscape connectivity afforded by the stands on DNRC-managed lands would not change appreciably; 3) no changes to snags, snag recruits, or coarse woody debris levels would be expected; and 4) no changes to human access or the potential for trapping mortality would be anticipated.

Direct and Indirect Effects of the Action Alternative to Fisher

No suitable riparian habitats would be altered with this alternative. Approximately 59 of the 277 acres (21%) of upland fisher habitats in the project area would receive treatments; some of those upland fisher habitats would likely retain sufficient canopy closure to be considered fisher habitat following proposed treatments. No changes in open roads would be anticipated, which would not likely alter trapping pressure and the potential for fisher mortality. Negligible reductions in landscape connectivity could occur with the proposed activities, and activities would avoid riparian areas commonly used by fisher. Thus, a minor risk of adverse direct and indirect effects to fisher would be anticipated since: 1) harvesting would avoid riparian areas; 2) harvesting would modify upland fisher habitats, but some continued use would be possible; 3) negligible reductions in landscape connectivity would occur, but those areas associated with riparian areas would remain unaffected; 4) harvesting would reduce snags and snag-recruitment trees while increasing coarse woody debris levels; however, some of these resources would be retained; and 5) no appreciable changes in motorized human-access levels would be anticipated.

Cumulative Effects of the Action Alternative to Fisher

Since no changes in riparian habitats would occur, no appreciable changes in the amount of the preferred riparian fisher cover types meeting structural requirements for fishers at the cumulative-effects analysis area would occur. Some minor reductions in suitable upland fisher habitats in the project area would be possible, which could lead to negligible reductions in the amount of suitable upland fisher habitats in the cumulative effects analysis area. These reductions would be additive to the losses associated with past timber harvesting in the cumulative-effects analysis area as well as any ongoing and/or proposed harvesting. No appreciable changes to landscape connectivity would be anticipated, and activities would avoid riparian areas commonly used by fisher. No appreciable changes in human disturbance and potential trapping mortality would be anticipated. Thus, a minor risk of adverse cumulative effects to fisher would be anticipated since: 1) harvesting would remove upland fisher habitats, but considerable upland habitats would persist; 2) no appreciable changes in landscape connectivity would be anticipated, but connectivity in riparian areas would not be altered; 3) harvesting in a relatively small portion of the cumulative-effects analysis area would partially reduce snags and snag recruits, while increasing the coarse woody debris levels, largely in the smaller-sized pieces; and 4) no appreciable changes to motorized human access would occur.

Gray Wolf

Direct and Indirect Effects of the No-Action Alternative to Gray Wolves

Disturbance to wolves would not increase. No changes in big game habitat, including no changes to big game winter ranges, would be expected during the short-term; therefore, no changes in wolf prey

availability would be anticipated. Thus, no direct and indirect effects would be expected to gray wolves since: 1) no changes in human disturbance levels would occur; and 2) no changes to prey availability would occur.

Cumulative Effects of the No-Action Alternative to Gray Wolves

White-tailed deer and elk winter ranges would not be affected and substantive changes in big game populations, distribution, or habitat use would be not anticipated. Levels of human disturbance would be expected to remain similar to present levels. Past harvesting and any ongoing harvesting may cause shifts in big game use and, subsequently, gray wolf use, of the cumulative-effects analysis area; however, no changes would be anticipated that would alter levels of gray wolf use of the cumulative-effects analysis area. Thus, no further cumulative effects to gray wolves would be expected since: 1) no changes in human disturbance levels would occur, particularly near known wolf den and/or rendezvous sites; and 2) no changes to prey availability would occur.

Direct and Indirect Effects of the Action Alternative to Gray Wolves

Wolves using the area could be disturbed by harvesting activities and are most sensitive at den and rendezvous sites, which are not known to occur in the project area or within 1 mile of the project area. After harvesting activities, human disturbance levels would likely revert to pre-harvest levels. Likewise, wolf use of the project area for denning and rendezvous sites would likely revert to pre-harvest levels. In the short-term, the proposed harvesting could lead to shifts in big game use, which could lead to a shift in wolf use of the project area. Harvesting on approximately 63 acres of winter range would modify roughly 36% of the stands in the project area with dense canopies that are providing some thermal cover and snow intercept. Collectively, the modifications to summer and winter range would likely alter big game use of the project area, and subsequently alter the use of the project area by wolves. Thus, a low risk of direct and indirect effects would be expected to gray wolves since: 1) minor short-term increases and no long-term changes in human disturbance levels would occur, with no increases near known wolf den and/or rendezvous sites anticipated; and 2) changes to summer and winter big game habitats would alter big game use of the project area, but would not appreciably alter prey availability.

Cumulative Effects of the Action Alternative to Gray Wolves

Reductions in thermal cover and snow intercept capacity on a portion of the winter range in the cumulative effects analysis area could redistribute the big game relying on those habitats, and subsequently shift wolf use of a small portion of the cumulative effects analysis area. Reductions in cover may cause slight decreases in use by deer and elk; however, no appreciable changes would be expected within the cumulative-effects analysis area. These reductions in cover would be additive to losses from past timber-harvesting activities as well as any ongoing harvesting in the cumulative-effects analysis area. No changes in motorized human access would be anticipated. No substantive change in wolf use of the cumulative-effects analysis area would be expected; wolves could continue to use the area in the long-term. Thus, a low risk of cumulative effects to gray wolves would be expected since: 1) elevated human disturbance levels would be short-lived and negligible changes to long-term disturbance levels would be anticipated with no increases near known wolf den and/or rendezvous sites; and 2) modifications to big game winter range could alter big game distributions, but would not appreciably alter prey availability.

Pileated Woodpecker

Direct and Indirect Effects of the No-Action Alternative to Pileated Woodpeckers

A negligible risk of adverse direct and indirect effects to pileated woodpeckers would be expected since: 1) no harvesting would occur; 2) no changes in the amount of continuously forested habitats would be anticipated; 3) no appreciable changes to existing pileated woodpecker habitats would be anticipated; and 4) long-term, succession-related declines in the abundance of shade-intolerant tree species, which are valuable to pileated woodpeckers, would be anticipated.

Cumulative Effects of the No-Action Alternative to Pileated Woodpeckers

No disturbance of pileated woodpeckers would occur. Continued use of the cumulative-effects analysis area by pileated woodpeckers would be expected at levels similar to the existing condition. Thus, a negligible risk of adverse cumulative effects to pileated woodpeckers would be expected since: 1) no further changes to existing habitats would occur; 2) no further changes to the amount of continuously forested habitats available for pileated woodpeckers would be anticipated; and 3) long-term, succession-related changes in the abundance of shade-intolerant tree species, which are valuable to pileated woodpeckers, would occur.

Direct and Indirect Effects of the Action Alternative to Pileated Woodpeckers

Pileated woodpeckers tend to be tolerant of human activities (Bull and Jackson 1995), but might be temporarily displaced by the proposed harvesting on roughly 126 acres, should those activities occur during the nesting season. No appreciable disturbance to pileated woodpeckers would be anticipated should the proposed activities occur during the non-nesting period. Harvesting would alter some of the continuously-forested habitats suitable for pileated woodpeckers in the project area, but past activities have already modified this attribute. Roughly 30 acres of the 149 acres of potential nesting habitat (20%) would be modified and an additional 94 acres of the 396 acres of potential foraging habitats (24%) would be modified. Some of these acres would continue to be dense enough to receive some use by pileated woodpeckers following proposed treatments. Following potential reductions in quality associated with the propose activities, habitats would gradually improve in quality for pileated woodpeckers over the next 20-50 years, depending on the density of trees retained. Elements of the forest structure important for nesting pileated woodpeckers, including snags, coarse woody debris, numerous leave trees, and snag recruits would be retained in the proposed harvest areas. Since pileated woodpecker density is positively correlated with the amount of dead and/or dying wood in a stand (McClelland 1979), pileated woodpecker densities in the project area would be expected to be reduced on 126 acres. The silvicultural prescriptions would retain healthy western larch, ponderosa pine, and Douglas-fir while promoting the growth and/or regeneration of many of these same species, which would benefit pileated woodpeckers in the future by providing nesting, roosting, and foraging habitats. Thus, a minor risk of adverse direct and indirect effects to pileated woodpeckers would be anticipated since: 1) harvesting would alter the amount of continuous-forested habitats available; 2) potential nesting habitats and potential foraging habitats would be altered, which could alter the suitability of those habitats for pileated woodpeckers; 3) snags and snag recruits would be removed; however, mitigation measures to retain snags and snag recruits would be included, and 4) proposed treatments would promote seral species in the project area.

Cumulative Effects of the Action Alternative to Pileated Woodpeckers

Minor changes in pileated woodpecker habitats and further modifications in the amount of continuously forested habitats available in the cumulative effects analysis area would occur. Several

snags, coarse woody debris, and potential nesting trees would be retained in the project area; however, future recruitment of these attributes may be reduced in a portion of the area by the proposed activities. Any modifications to pileated woodpecker habitats under this alternative would be additive to modifications associated with past harvesting; continued use of the cumulative-effects analysis area would be expected. Continued maturation of stands across the cumulative-effects analysis area is increasing suitable pileated woodpecker habitats. Thus, a minor risk of adverse cumulative effects to pileated woodpeckers would be anticipated since: 1) harvesting would slightly alter the amount of continuous forested habitats available in the cumulative-effects analysis area, but forested habitats would persist; 2) potential nesting and foraging habitats would be modified, but habitats would persist in the cumulative-effects analysis area; 3) snags and snag recruits could be removed; however, mitigation measures would retain some of these attributes; and 4) proposed treatments would promote seral species in a small portion of the cumulative effects analysis area.

BIG GAME

Big Game Winter Range

Direct and Indirect Effects of the No-Action Alternative to Big Game Winter Range

No direct or indirect effects to big game winter range would be anticipated since: 1) subtle changes in thermal cover due to mortality and successional advances increasing canopy densities would be anticipated; 2) the amount of mature forested habitats on the winter range would not change appreciably; and 3) the levels of human disturbance would remain similar.

Cumulative Effects of the No-Action Alternative to Big Game Winter Range

Continued winter use of the larger winter range would be expected. No further changes in thermal cover and snow intercept would be anticipated. Human disturbance levels would be anticipated to continue at similar levels. Thus, minor positive cumulative effects to big game winter range would be anticipated since: 1) subtle changes in thermal cover due to advances in succession that would increase canopy densities would be anticipated over time; 2) the amount of mature forested habitats on the winter range would not change; and 3) the levels of human disturbance would remain similar.

Direct and Indirect Effects of the Action Alternative to Big Game Winter Range

No disturbance or displacement of wintering big game would be anticipated should activities occur outside of the winter period; some disturbance and displacement would be expected if with activities were conducted during the winter. However, winter logging provides felled tree tops, limbs, and slash piles that could concentrate feeding deer during nighttime and quiet periods when logging operations are shut down. Increasing short-term forage availability in this manner may partially offset some of the effects associated with temporary displacement caused by logging disturbance. This short-term benefit would not be expected to offset effects associated with reductions in thermal cover over the long-term (several decades). Thermal cover and snow intercept would be reduced on roughly 63 acres of the 176 acres (36%) of winter range with the proposed activities. Proposed timber harvesting would not prevent big game movement through the project area appreciably in winter and could stimulate browse production within the units. Thus, a minor risk of adverse direct or indirect effects to big game winter range would be anticipated since: 1) the relatively short-term that logging activities could create disturbance in this area; 2) harvesting would alter stands that are providing thermal cover and snow intercept habitats for big game species; and 3) a moderate amount of the winter range in the project area would be altered.

Cumulative Effects of the Action Alternative to Big Game Winter Range

Disturbance and displacement associated with this alternative would be additive to any displacement associated with ongoing activities in the cumulative effects analysis area and any other disturbances that may be affecting wintering big game. Similarly, any harvesting that may be occurring on other ownerships in the cumulative effects analysis area could continue altering big game winter range and/or disturbing big game. Modifications to thermal cover and snow intercept in the project area could further alter the amount of the larger winter range providing these attributes for big game. Thus, a minor risk of adverse cumulative effects to big game would be anticipated since 1) the relatively short-term that logging activities would create disturbance in a small portion of the cumulative effects analysis area; 2) a small percentage of the larger winter range would be altered; 3) availability of lower-quality cover in the vicinity that provides some opportunity for big game should they be displaced.

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West Fork Timber Creek
Watershed, Soils, Noxious Weeds and Fisheries Analysis

Introduction and Issue Statements

The following report describes the existing conditions of soils, water resources, fisheries and noxious weed management for the proposed West Fork of Timber Creek Timber Sale. This report includes the environmental assessments of the expected direct, indirect and cumulative effects of the project for these resources.

Issues and Concerns

The following issue statements were developed from internal and public scoping regarding the effects of the proposed timber harvest and road systems to water resources, fisheries, soils and noxious weeds. For specific comments and concerns, refer to the project file.

* Soil Resources – There is a concern that forest management activities may result in increased erosion and reduced soil productivity where excessive disturbance from compaction, displacement, or loss of nutrients occurs, depending on the extent and degree of harvest related soil effects.

*Water Quality - There is a concern that the proposed action may cause impacts to water quality and quantity from timber management, road construction and road use. A p-public comment was received that a private landowner in the NW1/4, NW 1/4, Section 22, T19N, R30W has a gravity flow water system on the East Fork of Timber Creek and extreme care should be taken upstream so as not to adversely affect the private water supply.

*Cumulative Watershed Effects- There is a concern that the proposed timber harvest may cause or contribute to cumulative watershed impacts as a result of increased water yields.

*Cold Water Fisheries- The proposed forest management actions may have effects to fisheries and fish habitat features on project site streams that include: sedimentation, woody debris recruitment and increased stream temperature. Timber Creek and Savenac Creek support coldwater fish and comments were received to avoid timber harvest in the Riparian/SMZ of Savenac Creek.

* Noxious weeds- There is a concern that the proposed forest management activities may introduce or spread noxious weeds and that disturbed roads should be reseeded.

Recommended Mitigation Measures for Soil, Water Resources and Noxious Weed Management:

The analysis and levels of effects to soil resources, water resources, fisheries and noxious weeds are based on implementation of the following mitigation measures.

* DNRC would implement all applicable Best Management Practices (BMP's), Montana Administrative Rules for Forest Management, and reasonable mitigation and erosion control practices during timber harvest, road maintenance, and road construction and road use activities. The commitments of the DNRC Habitat Conservation Plan (HCP) apply to portions of Section 16, T19N, R30W and would be implemented on the applicable parcels.

* DNRC would locate, clearly mark and maintain suitable water resource protection boundaries including Streamside Management Zones (SMZ's), Riparian Management Zones (RMZ's), and

Wetland Management Zones (WMZ's) adjacent to streams and wetlands consistent with State Forest Land Management Rules.

* Along the harvest unit boundary adjacent to the East Fork of Timber Creek, locate a 50 ft. no cut harvest boundary along the Class 1 stream segment in section 15 and a 100 ft. Riparian Management Zone (RMZ). Within the RMZ, retain 50% of representative standing trees in the 50-100 ft. strip that would be designated parallel to the East Fork of Timber Creek.

* Limit harvest equipment and hauling operations to periods when soils are relatively dry, (less than 20%), frozen or snow covered to minimize soil compaction and rutting, and maintain drainage features. Soil moisture conditions would be determined prior to equipment start-up. Portions of the access roads have clay segments that tend to remain wet later into the spring which would require strict adherence to dry or frozen season of use restrictions to limit impacts in harvest units or damage to roads. Some moister conditions are accepted on harvest units where tractors remain on designated trails and timber would be felled and bunched or winched to trails.

* On tractor harvest units the logger and sale administrator would agree to a general skidding plan prior to equipment operations to limit trails to 15% or less of the harvest unit. Use of existing skid trails would be preferred, unless they are too steep. Ground skidding equipment would be limited to slopes less than 45%.

* On moderate to densely stocked stands, whole tree skidding can reduce slash hazard, however, it can also remove a portion of nutrients from growing sites. Target levels of fine slash and woody debris would be to retain 5-15 tons/acre well distributed on site while meeting the requirements of the slash law. On thinning sites with lower basal area, large woody debris would be retained as feasible since it may not be possible to retain 5 tons/acre and the emphasis would be on providing additional coarse woody debris (CWD) in the future. Slash would be placed on main skid trails to protect soils, reduce erosion potential, and prevent potential unauthorized ATV use as needed.

* Existing secondary road segments would be maintained in association with the harvest activities. Road improvements would include surface blading, and installation of drainage features to prevent surface erosion and sediment delivery to the stream to improve road surface stability of selected segments as needed to comply with BMP'S, and to protect water quality.

* Road use would be limited to dry or frozen ground conditions to reduce rutting and erosion. New road construction, including drainage features should be completed in the fall prior to freeze-up. During contract administration, check snow/frozen ground conditions prior to operations. Minimal effects are expected with snow road construction.

* Up to 1.5 miles of temporary road would be constructed with the minimal amount of excavation required. These temporary roads would be closed to traffic and stabilized with adequate road surface drainage for long term stability after use and grass seeding to control erosion.

* All road maintenance and harvest equipment would be cleaned of plant parts, mud and weed seed to prevent the introduction of noxious weeds. Equipment would be subject to inspection by the Forest Officer prior to moving on site.

* All newly disturbed soils on road cuts and fills would be promptly reseeded to site adapted grasses to reduce weed encroachment and stabilize roads from erosion.

* Weed treatment measures would include roadside and spot herbicide treatment of noxious weeds. Where herbicide treatments are required by the Forest Officer, herbicide must be applied under the supervision of a licensed applicator following label directions in accordance with Department of Agriculture regulations, applicable laws and rules and regulations of the Mineral County Weed Board.

* DNRC would monitor the project roads and areas to evaluate weed control measures implemented and to determine if any new noxious weeds become established.

Soils Analysis Methods and Area

The soils analysis included an evaluation of St Regis Soil Survey data, air photos, past harvest design and on-site field reviews by a DNRC hydrologist/soil scientist. For the purposes of this analysis, minor soils of 5% or less of the area were grouped based on slope, soil properties and interpretations. Field reviews were conducted to verify the soil properties and current conditions to assess past and predicted effects based on DNRC soil monitoring results on previous harvest operations. The soil analysis considered soil interpretations and the physical effects to soils from the area and degree of harvest disturbance associated with skidding and roads. The analysis for soil nutrients considers the area of disturbed surface and the fine litter and coarse woody debris available to supply organic materials to the soil.

The analysis area for geology and soil resources includes the proposed harvest units and locations of new and temporary road construction within parcels of Sections 15&16 T19N, R30W.

Existing Conditions- Geology & Soils

The proposed harvest is located within the Timber Creek alluvial valley and foothills above the St. Regis River. Primary parent materials are deep alluvium, Lake Missoula sediments and glacial tills derived from hard shale argillites of the Belt series bedrock. The majority of the project area is located on mainly moderate slopes of 4-35% with lesser areas of 35 to 60%. No notable unstable or unique geology occurs on the proposed project area and the Belt series argillites are among the most stable bedrocks in Montana. Shallow bedrock may occur on steeper slopes on steeper convex slopes, but should be common material or rippable, and not restrict road construction. Soil descriptions are generally described here as referenced in St Regis-Ninemile Soil Survey for the areas on appendix soil map S-1. There is a moderate to high levels of existing forest floor coarse woody debris across the proposed harvest areas similar to the range of woody debris levels based on habitat types established by Graham et al. (1994).

Primary soils are Savenac silt loams forming the gently sloping terraces in the stream valley terrain of section 15 & 16, bounded by Drexel shaly silt loams, and Holloway stony loams soils, on the adjacent foot slopes. Savenac soils have a reddish brown, volcanic ash silt loam surface, over deep silty clay subsoils from mixed glacial Lake Missoula and alluvial sediments. Savenac soils in this area have a slightly higher content of gravels and cobbles than typical. These soils have poor bearing strength and are susceptible to compaction and rutting if operated on when wet, but are suitable for ground based equipment operations if relatively dry or frozen. Erosivity is moderate and increases to high on steeper slopes. Erosion can be effectively controlled with standard drainage and erosion control practices. Soil displacement and compaction hazards are moderate for harvest operations and can be mitigated by limiting disturbance and season of use. Unsurfaced roads are prone to rutting if operated on when wet.

These soils are productive, supporting Grand fir and Douglas fir habitats with western larch, white pine and lodgepole pine. The flat slopes of map unit SA1 can be frosty, and partial retention of tree canopy can help moderate microclimate for establishing white pine and western larch. These are competitive vegetative types where scarification and inter-planting can help improve timely regeneration of conifers.

Map Unit HO2 is Holloway gravelly silt loam soils on 30-65% slopes. Holloway soils are well drained with a volcanic ash surface and are more productive than Drexel soils. Drexel soils are well drained, deep shaly silt loam subsoils which occur on drier sites and have little or no ash surface. Primary concerns are compaction and displacement. Erosivity for both Holloway and Drexel soils is moderate and increases to high on steeper slopes >45%. Soil displacement, compaction and erosion hazards can be effectively mitigated by limiting tractor operations to slopes less than 45%, limiting disturbance and by implementing standard drainage practices. Operational season of use limitations to relatively dry, frozen or snow conditions can also reduce disturbance and compaction. Drexel soils have the longest season of use. Deeper soils in swales and riparian areas supporting aspen remain wet later in the spring and are prone to rutting if operated on when wet.

There has been minor selective harvest in portions of the proposed harvest areas, mainly over 30 years ago, and prior effects have ameliorated to < 5% of the sites. No eroded trails or BMP departures were noted on the proposed sites. There are moderate levels of existing downed coarse woody debris across the proposed harvest area that is within the range of woody debris levels similar to the range of woody debris levels based on habitat types established by Graham et al. (1994). The tree mortality from insects has resulted in pine trees shedding their needles, which helps return organic matter and nutrients to the soil. Retaining vegetative litter and woody debris helps to control erosion on disturbed sites and provide media for healthy soil fungi and conservation of soil nutrients important to tree growth. It is desirable to maintain old and new coarse woody debris (>3" dia.) at ~10-15 tons/acre on the harvest units.

Direct- Indirect and Cumulative Effects of the No Action Alternative on Soils
The effects of the No Action Alternative would be the same as previously described under existing conditions for soils. Minor areas of older skid trails and effects would continue to recover over time.

Direct and Indirect Effects of the Action Alternative on Soils
The proposed prescription is a combination of salvage harvest of dead, dying and high-risk trees and thinning to reduce competition and improve growth while retaining western larch, western white pine, Douglas-fir and ponderosa pine. Approximately 125 acres would be treated by ground based timber harvest. Primary soil concerns are potential for excessive surface disturbance, erosion or soil compaction with harvest operations. Slopes in the proposed harvest areas are 5-45% and are well suited to ground based skidding operations.

To maintain soil productivity, and promote conifer regeneration, BMP's and the listed mitigation measures would be implemented to minimize the area and degree of soil effects associated with harvest operations. Mitigations include skid trail planning, limiting season of use to dry or frozen conditions, installing drainage where needed and retaining a portion of woody debris for nutrients and to control erosion on disturbed sites. Implementation of BMP's and the recommended mitigation measures, has been shown to effectively limit detrimental soil impacts to less than 20% of the harvest units based on DNRC soil monitoring on comparable sites (DNRC 2006) and recent harvest on nearby sites. We expect that by protecting at least ~80% of a harvest area in non-detrimental soil impacts, soil

properties important to soil productivity would be maintained. The estimates of existing impacts are approximately 5% and additional impacts from the proposed operations are expected to add up to 10% = 15% projected. Contract administration would monitor on-going operation to control soil disturbance to avoid excessive impacts and meet silvicultural goals to reduce competition. The improved tree spacing would improve growth of retained trees, due to reduced competition for soil nutrients and moisture.

Site specific road reconstruction requirements would be implemented to improve road drainage and control erosion. The 1.54 miles of proposed temporary roads would require minor excavation and would be stabilized and revegetated after use. For these reasons, there would be low to moderate risk of direct and indirect effects to soil resources as a result of the proposed action.

Cumulative Effects of the Action Alternative on Soils
Cumulative effects to soils can occur from repeated ground skidding entries into the harvest area and additional road construction, depending on area. Currently, there are minimal effects from the previous selective harvest and pole removal in the proposed harvest units, which occurred over 30 years ago. There are few old skid trails evident, and impacts are estimated to occupy less than 5% of the area and are well vegetated and stable. Implementation of the Action Alternative should present a low risk of cumulative effects based on the implementation of BMP's, and mitigation measures that would minimize the area of detrimental soil impacts. Large woody debris would be retained for nutrient cycling and long term productivity. The additive effects of the proposed harvest could be expected to cause detrimental impacts to 15% or less of the proposed units, based on harvest design.

Water Resources-Analysis Methods & Area
The primary concerns relating to water resources within the analysis area are the potential impacts to water quality from sediment sources on roads and forest sites that can deliver to stream channels as well as inside the channels. In order to address these issues the following parameters are analyzed for each alternative:

- ◊ Miles of new road construction and road improvements
- ◊ Potential for sediment delivery to streams
- ◊ Potential for water yield increase impacts to stream channel stability

A watershed analysis and field survey was completed by a DNRC hydrologist for the proposed project to determine direct, indirect and cumulative effects to water quality. The water quality evaluation included a review of existing inventories for soils and water resources (NRIS 2012, DNRC 2008), and reference to previous DNRC projects, and comparisons of aerial photos combined with GIS analysis to estimate the area of past timber harvest and vegetative recovery. Several field reviews were completed for the proposed harvest units, access roads and associated streams and the observations, information and data were integrated into the watershed analysis and design of project mitigations.

Sediment delivery
The analysis areas for sediment delivery are limited to the harvest units and roads used for hauling and will focus on the streams described as affected watersheds. This includes in-channel and upland sources of sediment that could result from this project. In-channel areas include the stream channels adjacent to and directly downstream of harvest areas. Upland sources include harvest units and roads that may contribute sediment delivery as a result of this project.

Water Yield
The analysis for cumulative effects to water yield considers the area of harvest units and access roads within the Timber Creek project drainages described as the affected watersheds. A DNRC hydrologist completed a coarse filter qualitative assessment of watershed conditions and cumulative effects as outlined in the Forest Management Rules (ARM 36.11.423) and the commitments described in the HCP concerning watershed management. Based on past logging in the area, an assessment of sediment sources and stream channel conditions was also completed. The potential for increases in surface runoff water yield and affects to stream channels will be discussed considering the distribution and timing of runoff.

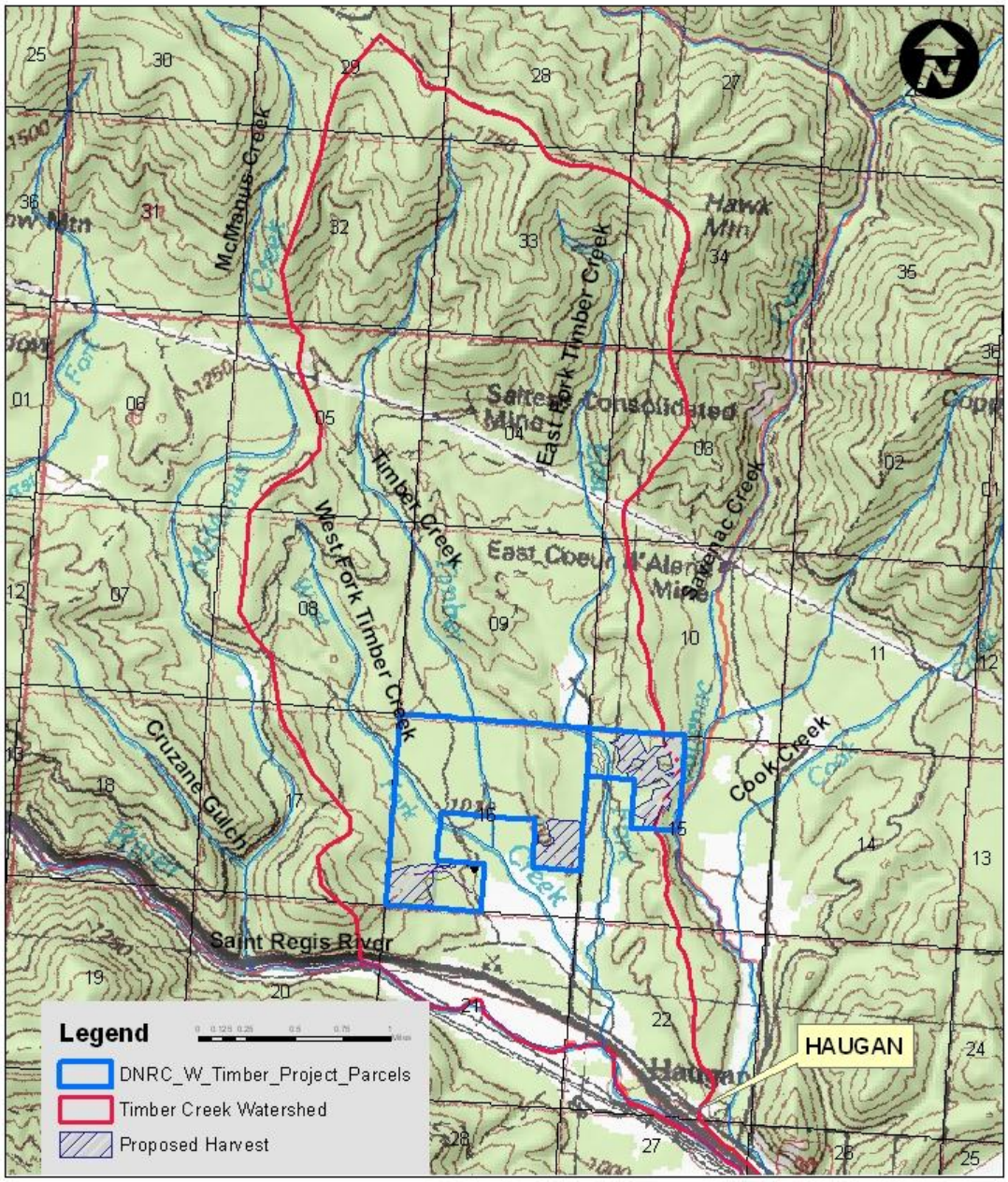
Affected Watershed
The project area is on the foothill slopes in the lower portion of the Timber Creek watershed (HUC 17010204) about 1 mile north of Haugen, Montana. Timber Creek is a 3rd order perennial tributary to the ST. Regis River in the Clark Fork River Basin. Timber Creek drains a watershed area of approximately 5,300 acres. The main stem stream channel of Timber Creek and the East and West Forks of Timber Creek tributaries are class 1 streams that flow across the DNRC parcels within sections 15 and 16.

The proposed West Fork Timber Creek Timber Sale project is located on state trust land within parts of Section 15 & 16, T19N, R30W of Mineral County (refer to Watershed Map WS-1). The proposed harvest areas within section 16 drain primarily toward the main stem of lower Timber Creek. The proposed harvest areas within section 15 drain primarily into the East Fork of Timber Creek.

The watershed analysis area also includes several wetlands and springs. Average precipitation ranges from a high of 70 in/yr in the Timber Creek headwaters near Hawk Mountain (elevation 5598 ft) to a low of 24 in/yr on the valley floor near Haugen (elevation 3130 ft.). Within the project area of state sections 15 & 16, the average precipitation is moderate at 25 in/yr and elevation range is 3220 to 3600 ft. Precipitation occurs mainly as snow, and spring runoff is not flashy due to moderate stream gradients and slopes. The watershed analysis area for this project includes the Timber Creek drainage which supports a mixed forest of lodgepole pine, Douglas-fir, ponderosa pine, western white pine and spruce.

The Lolo National Forest owns approximately 75% of the watershed, the State of Montana owns 7%, Plum Creek Timberlands owns 4% and non-industrial private landowners own the remaining 14% of the watershed as forest, range and residences.

Map WS-1 DNRC -West Fork Timber Sale Watershed Map



Minor Harvest within Savenac Creek drainage is dismissed from Further Analysis-
Minor harvest that includes salvage and thinning is proposed along a ridgeline in the NW ¼ of Section 15 T19N, R30W. Up to 10 acres of the proposed harvest is within the Savenac Creek drainage. The proposed timber harvest on the divide with the Savenac Creek drainage will be dismissed from further water resource and fisheries analysis due to low risks of direct, in-direct or cumulative effects based on the following. The proposed harvest is minor in area (10 acres) and is located on moderate slopes less than 40%. The harvest area has a wide buffer distance of over 300 feet from Savenac Creek, where no disturbance would occur. Timber harvested in this area would be skidded along the convex divide to a stable landing area within the Timber Creek watershed. There are no surface waters or drainage

features in the proposed harvest area, and there is low potential for any impacts of off-site runoff or sediment delivery.

Regulations, Laws, Rules and Agreements

Montana Surface Water Quality Regulations

The Timber Creek drainage is classified as B-1 in the Montana Surface Water Quality Standards (ARM 17.30.623). The water quality standards for protecting beneficial uses in B-1 classified watersheds are described in ARM 17.30.623. The B-1 classification is for multiple use waters suitable for; domestic use after conventional treatment, growth and propagation of cold-water fisheries, associated aquatic life and wildlife, agricultural, and industrial uses. Other criteria for B-1 waters include; no increases are allowed above naturally occurring concentrations of sediment, which will prove detrimental to fish or wildlife and a maximum 1 degree Fahrenheit increase above naturally occurring water temperature is allowed within the range of 32 to 66 degrees Fahrenheit. Naturally occurring includes conditions or materials present from runoff or percolation on developed land, where all reasonable land, soil, and water conservation practices have been applied. Reasonable conservation practices include methods, measures, or practices that protect present and reasonably anticipated beneficial uses. The State has adopted Forestry Best Management Practices BMP's through its Non-point Source Management Plan as the principle means of controlling non-point source pollution from silvicultural activities. Stream temperatures are discussed in the fisheries section. DNRC provides further protection of water quality and sensitive fish through implementation of the Streamside Management Zone (SMZ) Laws and Forest Management Rules.

Water Quality Limited Waterbodies and Beneficial Uses

Timber Creek is not listed as impaired on the State's 303(d) list of impaired bodies of water (MTDEQ 1996 & 2012). Timber Creek is a tributary to the St. Regis River (MT76F006_032), and the St. Regis River was listed as a water quality impaired stream for partially supporting aquatic life and cold water fisheries and causes of impairment are sediment and stream temperatures. Source assessments identify transportation, timber harvest, sources of bank erosion, and suburban activities as the primary sources of human caused pollutants in the St. Regis River. Total Max. Daily Load Assessments TMDL's were completed in 2008 and watershed restoration strategies for the St. Regis River focus on implementing road management BMPs; timber harvest BMPs; providing stream corridor shade and sediment buffers; suburban development BMPs; and other land, soil, and water conservation practices that relate to near stream channel and vegetation conditions.

Beneficial Uses- Downstream beneficial uses in Timber Creek include: domestic surface water rights, fisheries, irrigation, and livestock watering. Timber Creek is not part of a municipal watershed and fully supports the listed beneficial uses.

Water Rights- There are no water rights on the DNRC parcels proposed for harvest. There are historic irrigation ditches on the unnamed tributary to Timber Creek on private ownership downslope of the DNRC parcels. There are several ditches on Timber Creek that divert flows to hayfields and no segments with return flow were identified.

Montana Streamside Management Zone (SMZ) Law

All rules and regulations pertaining to the SMZ Law will be followed. An SMZ width of 100 feet is required on Class I and II streams when the slope is greater than 35%. An SMZ width of 50 feet is required when the slope is less than 35%.

DNRC Forest Management Rules and Habitat Conservation Plan
All applicable State Forest Land Management rules and regulations regarding watershed and fisheries management will be followed. This includes, but is not limited to rules listed for water quality (ARM 36.11.422), cumulative effects (36.11.423) Riparian Management Zones RMZ (ARM 36.11.425), Fisheries (ARM 36.11.427) . As part of ARM 36.11.427(3)(a)(i) and (iv) and ARM 36.11.436, DNRC is committed to designing forest management activities to protect and maintain bull trout, westslope cutthroat trout and all other sensitive fish and aquatic species as noted in the fisheries assessment. The East Fork of Timber Creek is a Class 1 fish bearing stream and DNRC would provide protection of this stream with 50 foot no-harvest buffers and RMZ's.
All applicable Conservation Strategies outlined in the DNRC Habitat Conservation Plan (HCP 2011) would be applied. The HCP applies to the SW ¼ of Section 16, T19N, R30W.

Montana Streamside Management Zone (SMZ) Law
All rules and regulations pertaining to the SMZ Law will be followed. An SMZ width of 100 feet is required on Class I and II streams when the slope is greater than 35%. An SMZ width of 50 feet is required when the slope is less than 35%.

Existing Conditions- Water Resources and Water Quality
Past management activities in the project area include timber harvest, grazing, road construction, fire suppression and recreation. Streams, roads and proposed harvest areas in the project area were reviewed for channel stability and sediment sources. Timber Creek and its tributaries of the West Fork of Timber Creek and the East Fork of Timber Creek are Class 1 perennial streams. Overall water quality in the Timber Creek drainage continues to be good based on the previous analysis (DNRC 1993, 2006) and recent stream channel stability assessments. Some potential impacts may have occurred on adjacent private lands associated with logging and road use practices in the early 1990's, but were likely temporary and have recovered. There is no apparent recent harvest from aerial photos taken in 2011.The proposed haul route from Haugen would utilize existing paved and graveled county roads located across private and DNRC lands. The Timber Creek county road to access the NE ¼ Section 15 and the SW 1/4 of Section 16 crosses Timber Creek and East Fork Timber Creek. The East Fork Timber Creek county road crossing has minor levels of sediment delivery from a ditch and the road surface.

The SW ¼ of section 16 has an unnamed Class 2 stream segment that flows along the north boundary of a proposed harvest unit, crosses the county road and then is diverted by a ditch and dispersed into a hay field on private lands. This stream does not have return flow to Timber Creek.

Existing Cumulative Watershed Effects
Cumulative watershed effects are described as impacts on water quality and quantity that result from the interaction of past and current conditions and the proposed management actions. A cumulative watershed effects assessment included the combined past and current effects across all ownerships in the watershed analysis area. Timber harvest and associated activities can affect the timing, distribution and amount of water yield in a watershed. DNRC completed a coarse filter evaluation of watershed conditions, road drainage and cumulative effects as outlined in Forest Management Rules (ARM 36.11.423) concerning watershed management. The coarse filter approach consisted of on-site evaluation, of harvest areas and roads, assessing the extent of past harvest activities, through the use of

maps and aerial photographs, and stream channel evaluations. Past management activities in the Timber Creek watershed include, timber harvest, mineral exploration, grazing and road construction. The drainage is dominated by mixed lodgepole pine/western larch forests that were initiated by the fires of 1910. Portions of the lower watershed were historically cleared for pasture on Private ownership. During the time period of 1980-1993, about 450 acres were harvested on Lolo National Forest lands. Approximately 17 miles of road were constructed in the drainage for timber management and construction of BPA power lines. Based on GIS analysis the density of existing roads is about 2 miles of road per square mile of the watershed analysis area.

Between 1990 and 1993, Plum Creek and other non-industrial private landowners harvested approximately 400 acres in the watershed. Portions of the non-industrial private lands have been subdivided as forested home sites. From 1994-1996 DNRC selectively harvested approximately 50% of the existing crown cover from 177 acres, and in 2007 DNRC harvested approximately 250 acres.

DNRC completed a water yield in 2006 using the Equivalent Clear-cut Acres (ECA) method as outlined in Forest Hydrology part 2 (Haupt et al. 1976). Watershed conditions have had minor change with limited selective thinning, pine mortality salvage and clearing for private home sites since 2007. Previously harvested sites have regenerated to conifers and recovered some water yield increases. ECA analysis estimates the water yield increase based on the amount of vegetative cover from natural disturbance such as fire and mortality or from timber harvest, roads or land clearing (refer to table WS-1).

Table WS-1 Summary of existing watershed conditions	
Total Watershed Area (acres)	5232
Existing Water Yield Increase	5.8%
Existing ECA (Acres) in Watershed	980
Portion of Watershed in ECA	18.5%

ECA is a function of precipitation, total area roaded and harvested, % crown cover removal in harvest areas and the amount of vegetative recovery that has occurred in the harvest area. Increases in water yield over total forested conditions can affect stream channel stability, yet a water yield of 10% over natural conditions is unlikely to have a measurable effect on stream stability. For this project DNRC committed to a low threshold for cumulative effects to protect water quality, fisheries and beneficial uses.

Stream channel stability ratings were completed on the main stem of Timber Creek and the East Fork Timber Creek, using the USFS Stream Reach Inventory and Channel Stability Evaluation Procedure (Pfankuch, 1978). All reaches evaluated were rated as good in 1994, 2005 and 2012. Based on these assessments there is low risk of existing cumulative impacts due to water yield and sediment delivery to streams in the project parcels.

Environmental Effects

The effects of the No Action Alternative would be the same as previously described under existing conditions for water resources. Sediment from County roads may occur in flux depending on the levels of road maintenance. Water yields may increase naturally, but not substantially, as older lodgepole stands are attacked by beetles and die. However, those increases are expected to be low, and well below those associated with detrimental water yield increases.

Water Quality Effects of the Action Alternative

The primary risk to water quality is associated with roads and especially stream crossings or sites where sediment could be delivered to stream channels. The proposed action would use existing county

access roads and construct up to 1.54 miles of temporary road, which is located well away from surface waters and presents low risk of sedimentation. The temporary road construction would have adequate drainage installed and following use would be stabilized, and revegetated to control erosion. Road maintenance would be completed on existing private access roads to improve drainage and would be maintained concurrently with operations to reduce maintenance needs. County road maintenance is completed by Mineral County. For this project, DNRC would install a slash filter windrow at the East Fork of Timber Creek crossing site to reduce current sediment from the road that may be affected by timber sale traffic.

Timber harvest equipment operations can directly impact water quality if off-site erosion occurs. No harvest is proposed within 400 feet of Timber Creek. Protection boundaries (SMZ's and Riparian Management Zones, RMZ's) would be located along harvest units that are adjacent to the streams and associated wetlands. With implementation of the Action Alternative, timber harvest of dead and dying lodgepole pine and selective harvest would occur on a small 2.4 acre unit that is adjacent to the East Fork of Timber Creek within section 15. The East Fork of Timber Creek would be protected by designating a Streamside Management Zone (SMZ), and Riparian Management Zone. No harvest would occur within the first 50 feet of the gently sloping SMZ adjacent to the East Fork of Timber Creek, to maintain a buffer to disturbance and prevent sedimentation. An RMZ of 100 ft width was designated adjacent to the East Fork of Timber Creek where up to 50% of the trees in the 50 to 100ft. band could be harvested.

A Class 2 SMZ is located along the unnamed stream segment in SW section 16, and the harvest unit boundary would generally be further back from the SMZ. The protective boundaries would restrict equipment operations to ensure protection of vegetative buffers and prevent erosion or sediment delivery consistent with Forest Management Rules for protection of streams with sensitive fish species present.

DNRC would implement all applicable BMP's, Forest Management Rules and site-specific mitigation measures to control erosion and protect water quality. The proposed timber harvest and road maintenance is expected to result in low risk of direct or indirect water quality impacts from erosion and sediment delivery due to buffer distances and implementation of mitigation measures. For these reasons, there is low risk of impacts to water quality or downstream beneficial uses occurring as a result of the proposed action.

Cumulative Watershed Effects of No Action Alternative

Past, current, and future planned activities within each analysis area have been taken into account for the cumulative effects analysis. Under the No Action Alternative, cumulative effects would remain the same as described in existing conditions.

Cumulative Watershed Effects of Action Alternative

The proposed timber harvest and road maintenance is expected to result in low risk of cumulative water quality impacts from erosion and sediment delivery due to buffer distances and implementation of mitigation measures. No new stream crossings are proposed. The proposed action would harvest dead, dying and high-risk lodgepole trees on up to 124 acres combined with harvest and thinning to reduce competition and improve growth. The lodgepole salvage harvest would range from group selection to patchy in distribution, reflective of the insect caused tree mortality. An overstory of mixed conifers including western larch, western white pine, Douglas-fir, cedar and ponderosa pine and

advanced regeneration would be retained. This level of harvest would create up to an additional 86 acres of equivalent clearcut area (ECA) as noted in the following table.

Table WS-1 Summary of existing watershed conditions	
Total Watershed Area (acres)	5232
Water Yield Increase with Proposed Project	8.3%
Existing ECA (Acres) in Watershed	980
Portion of Watershed in ECA	18.5%

There is low risk of cumulative watershed impacts due to water yield increases occurring from this proposal due to the following reasons. The low level of harvest on DNRC lands as a portion of the drainage area (~2.5%), the project is located near the valley floor with relatively low levels of precipitation (average 25 to 27 inches/yr), and would not noticeably increase water yield compared to leaving dead trees with lost canopy interception and evapotranspiration. There is a moderate amount of existing ECA and predicted water yield increase in Timber Creek from the proposed action would be less than 1% of the water yield for this drainage. The combination of salvage and selective harvest is expected to accelerate growth and vigor of the retained trees. The existing and proposed levels of harvest are less than a 10% threshold and below the levels normally associated with detrimental increases in water yield, peak flow, or duration of peak flows, therefore, there is low risk of cumulative watershed effects as a result of this project.

Fisheries Analysis Methods and Area

Timber harvest and road construction can impact fish habitat primarily by accelerating sediment delivery to local stream channels and by decreasing large woody debris recruitment through the removal of trees near the stream channel. Reductions of stream shading may affect stream temperatures. Road crossings may affect habitat connectivity. The effects to fish and their habitat will be evaluated by analyzing the anticipated effects of sediment delivery on fish habitat in the project area and the potential reduction in available woody debris and shading to streams due to timber harvest activities. Analysis methods will consider fisheries populations as absent or present, and the fish habitat effects of; sediment, flow regimes (refer to water resources section), connectivity, large woody debris and the affect of stream shading on stream temperature. Expected effects to fisheries habitat will be addressed qualitatively using the current condition as a baseline and disclosing the expected changes due to the proposed alternatives.

The analysis areas to evaluate existing and potential impacts to fisheries are the general watershed areas of Timber Creek as described in the water quality and quantity section and noted on Watershed map WS-1.The initial fisheries analysis area was chosen as the watershed of known or potential fish-bearing streams and the proposed harvest units and associated roads that could have measurable or detectable impacts to those fish-bearing streams.

Project Area Dismissed from Further Analysis- Unnamed Tributary A

The proposed harvest within Unnamed Tributary A will be dismissed from fisheries analysis based on the following:

1. The short perennial stream reach does not support fish.

2. Tributary A is intercepted by a ditch and ends in a hay field without connectivity to Timber Creek.

Connectivity dismissed from Further Analysis
Initially, fish habitat connectivity was raised as a possible concern, but will be dismissed since the project would use existing Mineral County access roads and no new stream crossings are proposed, therefore both alternatives would not affect fish connectivity.

Minor Harvest within Savenac Creek drainage is dismissed from Further Analysis-
Minor harvest that includes salvage and thinning is proposed along a ridgeline in the NW ¼ of Section 15 T19N, R30W. Up to 10 acres of the proposed harvest would be within the Savenac Creek drainage. The proposed timber harvest on the divide with the Savenac Creek drainage will be dismissed from further water resource and fisheries analysis due to low risks of direct, in-direct or cumulative effects based on the following:

1. The proposed harvest is minor in area (10 acres) and is located on moderate slopes less than 40%.

2. The harvest area has a wide buffer distance of over 300 feet from Savenac Creek, where no disturbance would occur.

3. Timber harvested in this area would be skidded along the convex divide to a stable landing area within the Timber Creek watershed.

4. There are no surface waters or drainage features in the proposed harvest area, and there is low potential for any direct, in-direct or cumulative impacts to fisheries resources in the Savenac Creek drainage due to off-site runoff, sediment delivery or timber harvest.

Sediment Delivery
The analysis area for sediment delivery is limited to the harvest units and roads used for hauling. This includes in-channel and upland sources of sediment that could result from this project. The analysis methods for sediment delivery will follow those used in the Hydrology portion of this report.

Woody Debris Recruitment
The analysis area for woody debris is limited to those portions of the DNRC parcels that are adjacent to fish-bearing streams, and applies only to the section 15 parcel that includes East Fork Timber Creek. The analysis method for woody debris recruitment will evaluate the potential reduction in available woody debris due to timber harvest activities.

Shading and stream temperature
The analysis area for vegetative shading and stream temperature is limited to those portions of the DNRC parcels that are adjacent to fish-bearing streams. The analysis method will evaluate the potential reduction in vegetative shading due to timber harvest activities and the anticipated effects to stream temperatures.

Cumulative Effects
The cumulative effects analysis area for sediment delivery is limited to the harvest units and roads used for hauling. The cumulative effects analysis area for woody debris recruitment and stream temperature is the portion of the DNRC parcels that are adjacent to a fish-bearing stream.

Existing Conditions- Fisheries
Timber Creek supports a known fishery. Species present include brook trout, westslope cutthroat trout (WCT), and bull-trout. A fishery sampling completed in 2002 did not find bull trout in Timber Creek; however, bull trout are known to occur downstream in the ST Regis River and are extrapolated to occur in Timber Creek based on connectivity and suitable habitat (MTFWP 2006). The genetic nature of the WCT is not known, but potentially may include relatively pure genetic strains, although brook trout also occur in the drainage. Both westslope cutthroat trout and bull trout are considered sensitive species by DNRC. One minor source of road surface sediment was noted on the Timber Creek county road crossing of the East Fork of Timber Creek in the NW corner of section 15. All other access roads meet BMP's for road surface drainage. Some low levels of sediment from existing roads or grazing may occur in the Timber Creek watershed. Stream shading remains consistent since the previous assessment in 2006, although there may be a trend toward reduced shade from lodgepole mortality. Wetlands adjacent to stream channels are also shaded by mixed brush species. Stream channel stability was evaluated as good on stream segments of Timber Creek and the West Fork of Timber Creek on the DNRC parcel.

Fisheries Effects of the No-Action Alternative:
With no action, no road construction or timber harvest would occur. Some natural shading loss from dying trees will occur in the Timber Creek drainage. However this reduction in shading is minor and not expected to alter water temperatures or fish habitat, due to improved growth of young trees and continued shading of riparian shrubs.

Fisheries Effects of the Action Alternative:
The proposed ground based timber harvest and use of existing roads is expected to result in an overall low risk of erosion and sediment delivery to streams as disclosed in the water resources section. With the proposed action, road drainage would be improved to meet BMP's, control erosion and sedimentation. The East Fork Timber Creek crossing site would have a slash filter windrow installed along the ditch to reduce current sedimentation on the County road.

With implementation of the Action Alternative, timber harvest of dead and dying lodgepole pine and selective harvest would occur on a small 2.4 acre unit that is adjacent to the East Fork of Timber Creek within section 15. The East Fork of Timber Creek would be protected by designating a Streamside Management Zone (SMZ), and Riparian Management Zone. No harvest would occur within the first 50 feet of the gently sloping SMZ adjacent to the East Fork of Timber Creek, to maintain a buffer to disturbance and prevent sedimentation. An RMZ of 100 ft width was designated adjacent to the East Fork of Timber Creek where selective harvest of up to 50% of the trees in the 50 to 100ft. band could occur. There is expected to be a low risk of erosion or sediment delivery on this site or on the road.

No other proposed harvest would occur near a class one fisheries stream. As disclosed in the Hydrology Analysis, the cumulative effects to sediment delivery from the existing roads would be reduced because of BMP implementation and road maintenance. The proposed temporary roads are located well away from streams and would present a low risk of off-site erosion or sedimentation.

Large Woody Debris Recruitment
With implementation of the Action Alternative, no harvest would occur within the first 50 feet of the SMZ of East Timber Creek. A 100 foot RMZ would be designated as an extended buffer protection

zone parallel to and incorporating the full width of the SMZ based on the site potential tree heights (SPTH) at 100-years as required by ARM 36.11.425. Selective harvest to thin and selectively remove dead, dying and overstocked trees is proposed within the outer 50-100 ft. width of the RMZ for about 900 lineal feet. Within the RMZ , 50% or more of the trees >/= 8 inch diameter would be retained to provide recruitable snags for long term stream channel form, function and complex fish habitat and shading. The HCP analysis (DNRC 2011) found that retaining a 50 ft no harvest boundary with selective harvest in the RMZ would be expected to have a low risk of effects on large woody debris recruitment. This is expected to have a low risk of low impacts to associated fish habitats.

Shading and stream temperature
The combination of no harvest within 50 feet of the East Fork of Timber Creek and selective harvest in the RMZ (50 to 100 ft band) along a short stream reach would result in low potential for affecting stream temperatures. The HCP analysis (DNRC 2011) found that retaining a 50 ft no harvest boundary with selective harvest in the RMZ would be expected to have a low risk of effects on shading and, consequently, stream temperature. No other harvest is proposed near a class 1 stream reach.

In summary, there is low risk of impacts of sediment and overall low potential for long-term direct or in-direct impacts to fish and fish habitat. Project design mitigations are expected to ensure protection of fish habitat by reducing sediment from the county road crossing of the East Timber of Creek and maintaining adequate levels of recruitable large woody debris and stream shading. The proposed harvest would have low potential for increased water yield or flow alterations to streams in the project area as detailed in the Water Resources Section. There is low potential for changes in flow regime or impacts to stream channel forms that may affect fisheries habitat.

Cumulative Effects to Fish Habitat of the No-Action Alternative
No timber harvest or road construction is associated with this alternative. Existing sediment sources from existing roads, and land uses would continue to contribute sediment to streams in the analysis areas until remedial action were implemented or natural stabilization occurs.

Cumulative Effects to Fish Habitat of the Action Alternative
There would be an overall low risk of additional cumulative impacts to fisheries in Timber Creek and the East Fork Timber with the proposed timber harvest and temporary road construction due to the following reasons:

1. No harvest would occur near Timber Creek and no harvest would occur within 50 ft. of Class 1 streams including the East Fork of Timber Creek.

2. An RMZ boundary would be established adjacent to the south side of the East Fork of Timber Creek in section 15 to limit disturbance near water resources and protect vegetation to trap sediment. There would be minor effects to stream shading and low risk of measurable effects to stream temperature.

3. Streamside snags and recruitable trees would be retained to provide for long term woody debris availability to stream channels to maintain fisheries habitat.

4. Combined mitigation measures for harvest operations and season of use are all directed at minimizing soil disturbance to prevent erosion and sedimentation.

5. Road surface drainage on the haul route would be improved on private roads to comply with BMP's and on the East Fork of Timber Creek site, which would reduce sediment to the stream at the existing crossing.
6. No new roads would be constructed adjacent to or crossing fisheries streams.

7. The proposed levels of harvest would have low potential for increased water yield or flow alterations to streams in the project area as detailed in the Water Resources Section.

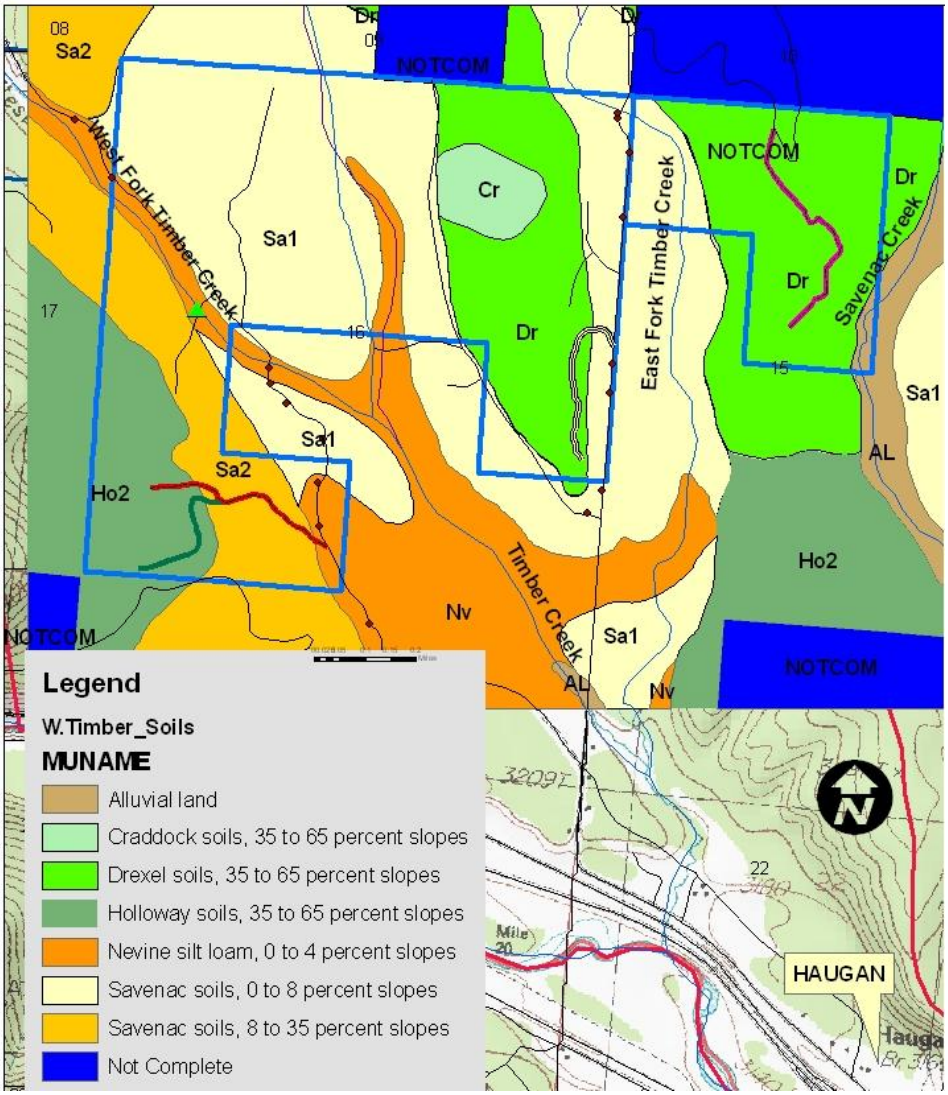
Noxious Weeds- Existing Conditions-
Existing noxious weed infestations are a combination of spotted knapweed and oxeye daisy which occur along portions of the existing access road system and within the section and along county roads and adjacent lands. Noxious weeds were treated with Milestone herbicide along segments of road in Section 16 to slow the spread of weeds and improve roadside grass vigor.

Effects of Noxious Weed Management
With no action, noxious weeds (spotted knapweed and oxeye daisy) will continue to spread along roads and increase on the drier site habitats.

Implementation of the Action Alternative would involve ground-disturbing activities that have the potential to introduce or spread noxious weeds in susceptible habitat types. Within the Action Alternative, an Integrated Weed Management (IWM) approach was considered. For this project: prevention, revegetation and weed control measures for spot outbreaks are considered the most effective weed management treatments. Noxious weed density and occurrence would be similar to or may result in a potential slight increase due to soil disturbance and decreased tree canopy. Control efforts would promote revegetation and emphasize treatment of any new noxious weeds. More weed control would occur compared to the No Action Alternative.

Herbicide application would be completed to contain spotted knapweed and daisy along segments of spot infested road as noted in mitigations. Herbicide would be applied according to labeled directions, laws and rules, and would be applied with adequate buffers to prevent herbicide runoff into surface waters. Implementation of IWM measures listed in the mitigations would reduce existing weeds, limit the possible spread of weeds, and improve current conditions, to promote existing native vegetation.

Map S-1 DNRC -West Fork Timber Sale Soils Map



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ATTACHMENT C
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